PRELIMINARY

—PRODUCT INFORMATION—

BEAM PENTODE

FOR RF POWER AMPLIFIER APPLICATIONS

ELECTRONIC INNOVATIONS IN ACTION — TUBES

M-2057

400 MILLIAMPERES DC CATHODE CURRENT | OVER 1 AMPERE PEAK CURRENT | 280 VOLTS B+

40 WATTS PLATE DISSIPATION | T-14 ENVELOPE

The M2057 is a compactron beam power pentode designed primarily for RF power output applications. Features of the M2057 are dual cathode and grid connections for lower lead inductance, and a 13.0 volt heater. The M2057 is suitable for mobile and marine applications having 12 volt battery supplies.

GENERAL

ELECTRICAL

Cathode Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC	13.0 Volts
Heater Current	1.30 Amperes

Direct Interelectrode Capacitances, approximate

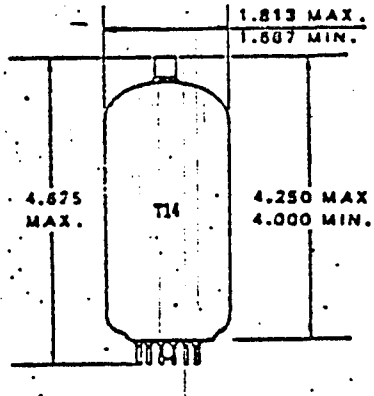
Grid No. 1 to Plate: (g1 to p)	0.55 pf
Input:	38 pf
Output:	14 pf

MECHANICAL

Operating Position Any
Envelope T-14, Glass
Top Cap C1-1, Small
Base E12-74
Outline Drawing

Maximum Diameter	1.813	Inches
Minimum Diameter	1.687	Inches
Maximum Overall Length	4.625	Inches
Maximum Seated Height	4.250	Inches
Minimum Seated Height	4.000	Inches

PHYSICAL DIMENSIONS

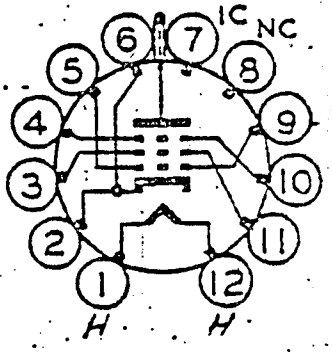


TERMINAL CONNECTIONS

13. volts

Pin 1 – Heater
Pin 2 – Cathode
Pin 3 – Grid 2
Pin 4 – Grid 3 (Beam Plate)
Pin 5 – Grid 1
Pin 6 – Cathode
Pin 7 – Internal Connection (Do not use)
Pin 8 – No Connection
Pin 9 – Grid 1
Pin 10 – Grid 3 (Beam Plate)
Pin 11 – Grid 2
Pin 12 – Heater
Cap – Plate

BASING DIAGRAM



EIA

GENERAL ELECTRIC

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES

Peak Positive Pulse Plate Voltage	7500	Volts
Screen Voltage	280	Volts
Peak Negative Grid-Number 1 Voltage	300	Volts
Plate Dissipation	40	Watts
Screen Dissipation	7.0	Watts
DC Cathode Current	400	Milliamperes
Peak Cathode Current	1400	Milliamperes
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode		
DC Component	100	Volts
Total DC and Peak	200	Volts
Heater Negative with Respect to Cathode		
Total DC and Peak	200	Volts
Grid-Number 1 Circuit Resistance▲		
With Fixed Bias	0.1	Megohm
With Cathode Bias	Not Recommended	
Bulb Temperature at Hottest Point♦	240	°C

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions; and variations in the characteristics of all other electron devices in the equipment.

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Plate Voltage	5000	60	100	250	Volts
Beam Plates - Connected to Cathode at Socket					
Screen Voltage	250	110	250	250	Volts
Grid-Number 1 Voltage	---	0	-20	-56	Volts
Plate Resistance, approximate	---	---	---	6700	Ohms
Transconductance	---	---	---	12000	Micromhos
Plate Current	---	650§	920§	125	Milliamperes
Screen Current	---	37§	94§	4.2	Milliamperes
Grid-Number 1 Voltage, approximate					
Ib = 1.0 Milliamperes	-135	---	---	-85	Volts
Triode Amplification Factor●	---	---	---	3.7	

MINIMUM RECOMMENDED GRID DRIVE

Peak Positive Plate Pulse Voltage	5000	6000	7000	Volts
Grid Drive for Eg2 = 150 Volts	-190	-210	-230	Volts
Grid Drive for Eg2 = 200 Volts	-210	-235	-260	Volts
Grid Drive for Eg2 = 250 Volts	□	□	□	Volts

NOTES

- The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.
- Heater current of a bogey tube at Ef 13.0 volts.

▲ The type of input-coupling network used should not introduce too much resistance in the grid-number 1 circuit. Transformer or impedance coupling devices are recommended.

♦ Measured with an infrared thermometer, Ircon Model 700 BC or equivalent, at an ambient temperature of 40° C.

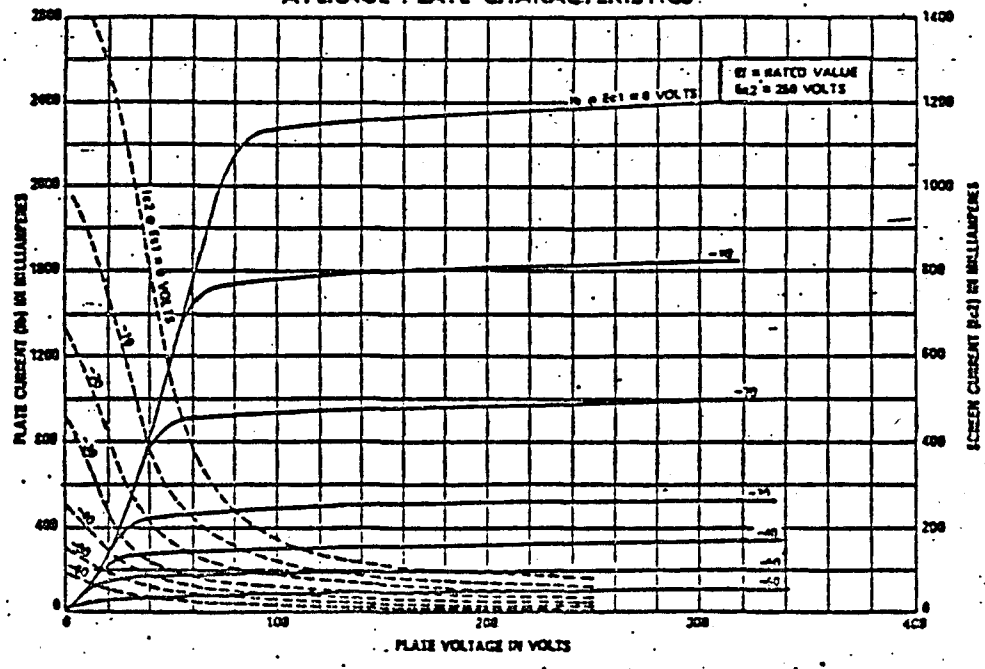
§ Values measured by a method involving a recurrent waveform such that the plate and screen dissipation will be kept within ratings in order to prevent damage to the tube.

● Triode connection (screen tied to plate) with Eb = Ec2 = 250 volts, and Ec1 = −56 volts.

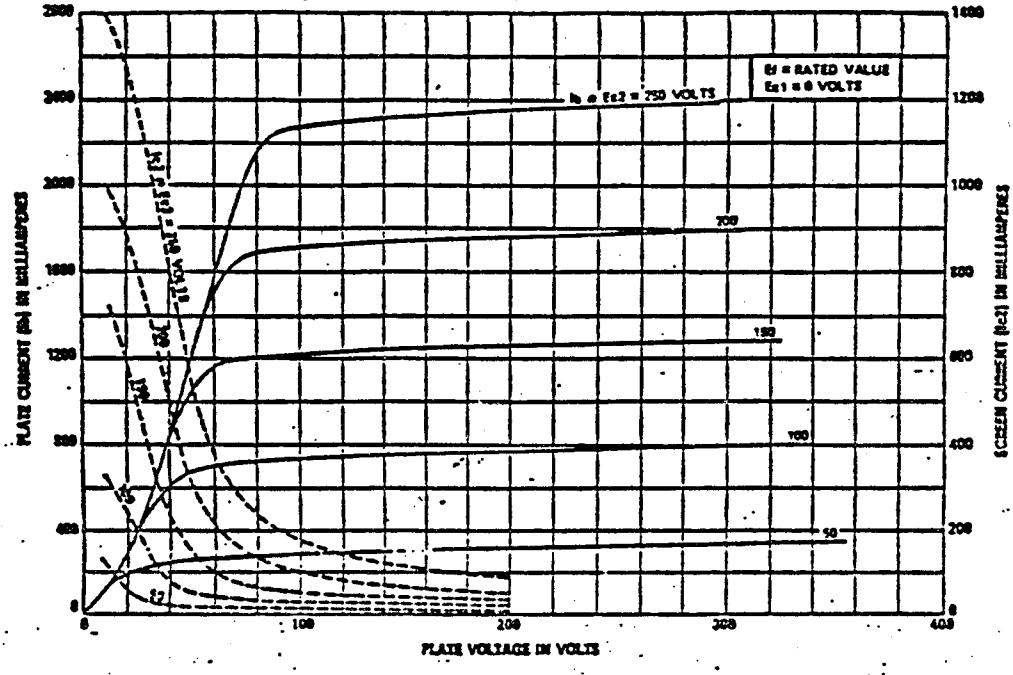
□ To be determined.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements, in the absence of an express written agreement to the contrary. General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



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