



12DS7

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DUPLEX-DIODE TETRODE

**FOR DETECTOR AND AF DRIVER APPLICATIONS IN
 AUTOMOBILE RECEIVERS**

DESCRIPTION AND RATINGS

The 12DS7 is a miniature duplex-diode, space-charge-grid tetrode intended for use as a combined detector, AVC rectifier, and transistor driver. The tube is specially designed to operate with its plate and space-charge-grid voltages supplied directly from a 12-volt storage battery.

GENERAL

ELECTRICAL

| | | |
|--|-------|---------|
| Cathode—Coated Unipotential | | |
| Heater Voltage, AC or DC | 12.6* | Volts |
| Heater Current | 0.4 | Amperes |
| Direct Interelectrode Capacitances† | | |
| Grid-Number 2 to Plate | 12.5 | μμf |
| Input | 13 | μμf |
| Output | 2.0 | μμf |
| Grid-Number 2 to Diode-Number 1 Plate, maximum | 0.15 | μμf |
| Grid-Number 2 to Diode-Number 2 Plate, maximum | 0.15 | μμf |
| Diode Plate to Diode Plate | 0.1 | μμf |
| Diode Plate to Cathode and Heater, Each Diode | 0.5 | μμf |

MECHANICAL

Mounting Position—Any
 Envelope—T-6½, Glass
 Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

DESIGN-CENTER VALUES UNLESS OTHERWISE INDICATED

| | | |
|--|-----|--------------|
| Plate Voltage | 16 | Volts |
| Negative Control-Grid Voltage | 16 | Volts |
| Space-Charge-Grid Voltage | 16‡ | Volts |
| Heater-Cathode Voltage | | |
| Heater Positive with Respect to Cathode | 16 | Volts |
| Heater Negative with Respect to Cathode | 16 | Volts |
| Control-Grid Circuit Resistance | 10 | Megohms |
| Diode Current for Continuous Operation, Each Diode | 5.0 | Milliamperes |

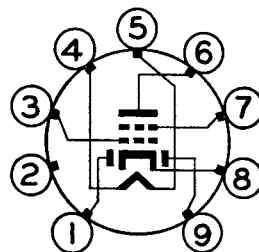
Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube in average applications, taking responsibility for normal changes in operating conditions due to rated supply-voltage variation (for an alternating-current power source, 117 volts plus or minus 10 percent is accepted USA practice), equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in tube characteristics.

The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey tube in equipment operating at the stated normal supply voltage.

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.

BASING DIAGRAM

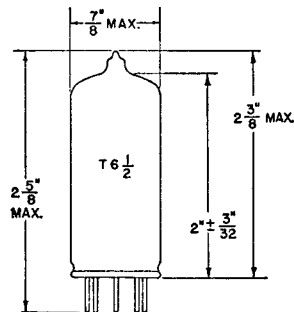


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TERMINAL CONNECTIONS

- Pin 1—Diode Number 2 Plate
- Pin 2—No Connection
- Pin 3—Tetrode Grid Number 1 (Space Charge Grid)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Tetrode Plate
- Pin 7—Tetrode Grid Number 2 (Control Grid)
- Pin 8—Cathode
- Pin 9—Diode Number 1 Plate

PHYSICAL DIMENSIONS



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CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

| | | |
|--|-------|--------------|
| Plate Voltage | 12.6 | Volts |
| Control-Grid Voltage | -0.5§ | Volts |
| Space-Charge-Grid Voltage | 12.6 | Volts |
| Amplifications Factors¶ | 7.2 | |
| Plate Resistance | 480 | Ohms |
| Transconductance¶ | 15000 | Micromhos |
| Plate Current | 40 | Milliamperes |
| Space-Charge-Grid Current | 75 | Milliamperes |
| Average Diode Current, Each Diode with 10 Volts DC Applied | 3.0 | Milliamperes |

CLASS A₁ AMPLIFIER

| | | |
|--|--------|--------------|
| Plate Voltage | 12.6 | Volts |
| Control-Grid Voltage | -2.0# | Volts |
| Space-Charge-Grid Voltage | 12.6 | Volts |
| Peak AF Control-Grid Voltage | 2.5 | Volts |
| AF Signal Source Resistance | 100000 | Ohms |
| Maximum Signal Plate Current | 8.0 | Milliamperes |
| Space-Charge-Grid Current | 75 | Milliamperes |
| Load Resistance | 800 | Ohms |
| Total Harmonic Distortion, approximate | 10 | Percent |
| Maximum-Signal Power Output | 40 | Milliwatts |

* When used in automobile service from a 12-volt source, under no circumstances should the heater voltage be less than 10.0 volts or more than 15.9 volts. These extreme variations in heater voltage may be tolerated for short periods; however, operation at or near these absolute limits in heater voltage necessarily involves sacrifice in performance at low heater voltage and in life expectancy at high heater voltage. Equipment reliability can be significantly increased with improved supply-voltage regulation.

† Without external shield.

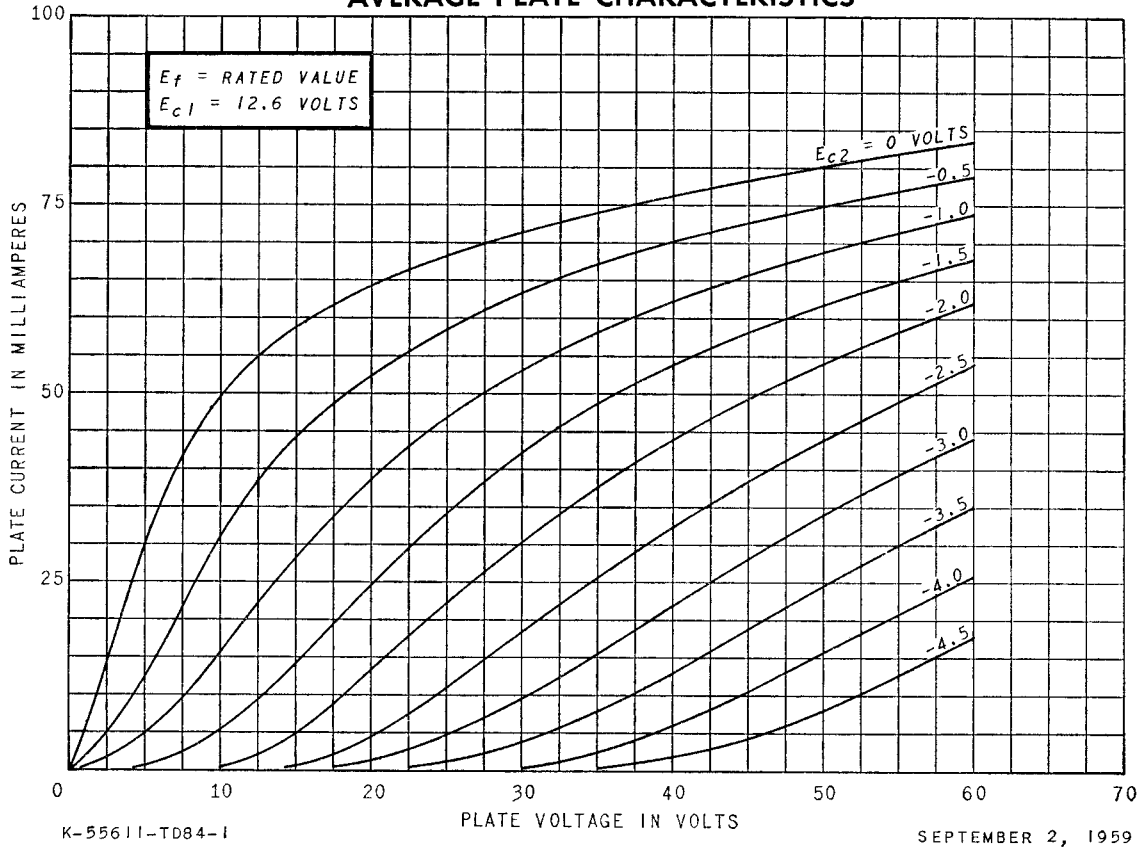
‡ Absolute Maximum Value.

§ Average bias developed across 2.2 megohm resistor.

¶ Control Grid to Plate.

Obtained by control-grid rectification (2.2-megohm grid resistor) in which case the zero-signal plate current is approximately 40 milliamperes.

AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS

