



**12DS7**

**12DS7**  
**ET-T1551**  
 Page 1  
 9-59

**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	$\mu\mu\text{f}$
Input	13	$\mu\mu\text{f}$
Output	2.0	$\mu\mu\text{f}$
Grid-Number 2 to Diode-Number 1 Plate, maximum	0.15	$\mu\mu\text{f}$
Grid-Number 2 to Diode-Number 2 Plate, maximum	0.15	$\mu\mu\text{f}$
Diode Plate to Diode Plate	0.1	$\mu\mu\text{f}$
Diode Plate to Cathode and Heater, Each Diode	0.5	$\mu\mu\text{f}$

**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

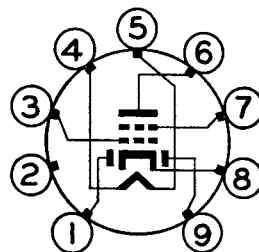
Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

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**

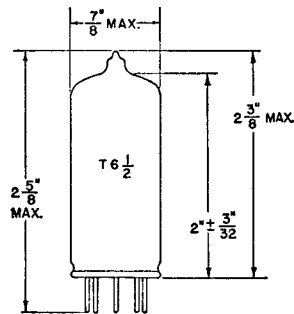


EIA 9JU

**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**



EIA 6-3



## 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 A<sub>1</sub> 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.

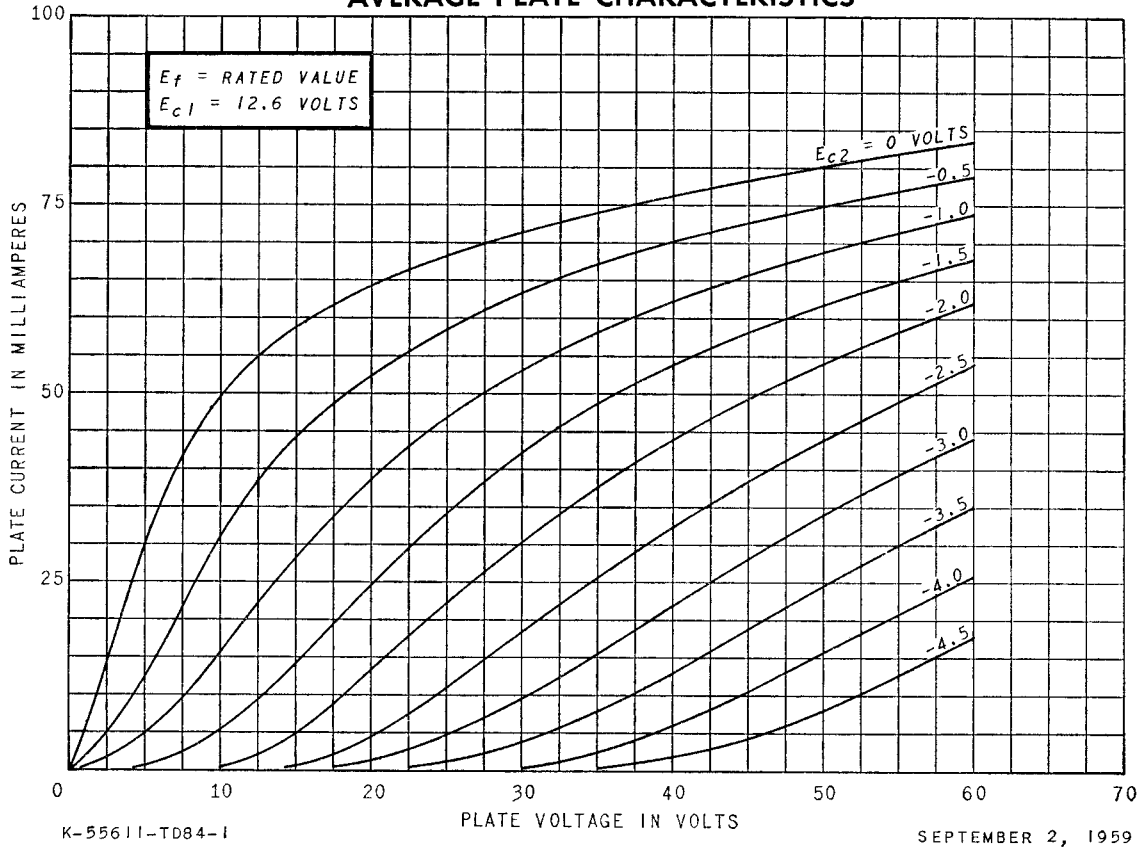
‡ Absolute Maximum Value.

§ 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

