

ELECTRONIC TUBE REFERENCE

12BT6

Voltage - Triode (with diode, heptode or hexode) electronic tube

CONSOLIDATED TECHNICAL DATA

3 SECTIONS
CONSTRUCTION
DIODE-DIODE-TRIODE

Double-diode high-mu triode for detector, control-voltage, and voltage-amplifier functions. The paired diodes provide signal rectification while the triode supplies substantial voltage gain in series-string receiving equipment.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7BT-0-2	BASE PINS	7
NOMINAL HEATER	12.6 V / 150 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Common cathode	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	68000 Ω
TRANSCONDUCTANCE	0.0012 S
AMPLIFICATION FACTOR	70
MAXIMUM PLATE VOLTAGE	300 V
Values promoted from the supplied Sylvania source where explicitly published.	

SECTION2 Diode	
No fixed ratings recorded.	
Values promoted from the supplied Sylvania source where explicitly published.	

No fixed ratings recorded.

Values promoted from the supplied Sylvania source where explicitly published.

12BT6 — Double-Diode Triode

The **12BT6** is a miniature, double-diode triode vacuum tube designed for service as a combined high-mu triode voltage amplifier and double diode detector. Constructed with a 7-pin miniature button base, the tube is engineered to deliver sufficient output voltage to drive most beam power tubes to their full power output. Its design features high-perveance diodes that provide efficient rectification at low signal levels, alongside a low diode-to-triode grid capacitance to minimize unwanted audio coupling between the sections.

Mechanical Specifications and Pin Connections

The 12BT6 is housed in a T-5 1/2 glass bulb and utilizes an E7-1 miniature button 7-pin base. The physical dimensions of the tube are compact, allowing for versatile installation in space-constrained layouts.

- **Maximum Diameter:** 3/4 inch
- **Maximum Overall Length:** 2 5/8 inches
- **Maximum Seated Height:** 2 3/8 inches
- **Mounting Position:** Any

The tube uses the **7BT** (or **7BT-0-2**) basing arrangement. The pin connections, viewed from the bottom of the base, are assigned as follows:

Pin	Connection
Pin 1	Triode Grid
Pin 2	Cathode, Diode Shield
Pin 3	Heater
Pin 4	Heater
Pin 5	#2 Diode Plate
Pin 6	#1 Diode Plate
Pin 7	Triode Plate

Heater and Maximum Ratings

The 12BT6 features an indirectly heated, coated unipotential cathode. The heater is designed to operate on either alternating or direct current. The maximum ratings are established under the Design Center

system (interpreted according to RMA Standard M8-210):

Parameter	Value
Heater Voltage (AC or DC)	12.6 V
Heater Current	150 mA
Maximum Plate Voltage (DC)	300 V
Maximum Heater-Cathode Voltage	90 V
Maximum Positive DC Grid Voltage	0 V
Maximum Continuous Diode Current (each plate)	1.0 mA

Electrical Characteristics and Operating Points

The triode section of the 12BT6 is characterized by a high amplification factor of 70, making it highly effective for voltage amplification. The typical operating conditions for the triode unit are specified at two distinct plate voltages:

Parameter	Operating Point I	Operating Point II
Plate Voltage (DC)	100 V	250 V
Grid Voltage (DC)	-1 V	-3 V
Plate Current	0.8 mA	1.0 mA
Plate Resistance	54,000 _Ω	58,000 _Ω
Transconductance	1,300 _μ mhos	1,200 _μ mhos
Amplification Factor	70	70

The diode units are designed for detection and rectification. At an applied potential of 10 volts DC, each diode plate exhibits the following current characteristics:

- **Minimum Diode Current:** 1.5 mA
- **Average Diode Current:** 4.0 mA

Interelectrode Capacitances

The direct interelectrode capacitances of the 12BT6 are low, which helps prevent signal degradation and coupling. The capacitances are measured both with and without an external shield (specifically, RMA Shield #316 connected to Pin 2):

Measurement	Without Shield	With Shield
Diode #1 to Cathode / Input: #1p to (h+k+i.s.)	1.0 μF	1.0 μF
Diode #2 to Cathode / Input: #2p to (h+k+i.s.)	1.0 μF	1.0 μF
Diode #1 Plate to Triode Grid (maximum)	0.013 μF	0.01 μF

The low maximum capacitance of 0.013 μF (or 0.01 μF with shield) between the first diode plate and the triode grid is critical for reducing audio coupling between the detector and amplifier sections of the tube.

Related Designations

The 12BT6 is closely associated with the **6BT6** designation. The two types share the same general double-diode triode configuration and characteristics, with the primary distinction being the heater requirements.

Technical Summary

The **12BT6** is a miniature, 7-pin double-diode triode featuring a high-mu triode section (amplification factor of 70) and two high-perveance diode units sharing a common unipotential cathode. Operating with a 12.6 V, 150 mA heater, the tube is optimized for combined detector and voltage amplifier service in compact receiver designs, capable of supplying sufficient output voltage to drive standard beam power output stages.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1950 SYLVANIA

Section 1 · Triode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Current	1 mA	PlateVoltage=250V



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Tung Sol

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1961 TUNG SOL

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	100250 V	Typical operating conditions
Plate current	0.81 mA	Typical operating conditions

1961 TUNG SOL

Section 2 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	100250 V	Typical operating conditions

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate current	0.81 mA	Typical operating conditions

1961 TUNG SOL

Section 3 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	12.6 V	Nominal
Heater current	150 mA	Nominal
Plate voltage	100250 V	Typical operating conditions
Plate current	0.81 mA	Typical operating conditions

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