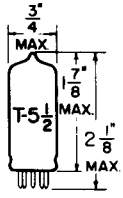
TUNG-SOL

DIODE

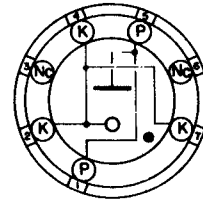
MINIATURE TYPE



GLASS BULB

COLD CATHODE – GLOW DISCHARGE

ANY MOUNTING POSITION



BOTTOM VIEW

SMALL MINIATURE BUTTON
7 PIN BASE

THE 5651 IS A MINIATURE TWO ELECTRODE INERT-GAS-FILLED, COLD CATHODE, GLOW DISCHARGE DIODE FOR USE AS A VOLTAGE REFERENCE TUBE IN ELECTRONIC REGULATED SUPPLIES. IT HAS AN OPERATING VOLTAGE OF 86 VOLTS OVER A CURRENT RANGE OF 1.5 TO 3.5 MILLIAMPERES. THIS TUBE IS IDEALLY SUITED FOR APPLICATIONS IN WHICH SUDDEN FLUCTUATIONS MUST BE KEPT BELOW 0.1 VOLTS OVER THE ENTIRE RANGE AND WHICH REQUIRE VERY LOW OPERATING VOLTAGE DRIFT AND LONG LIFE.

ELECTRICAL DATA

CATHODE	COLD	

MECHANICAL DATA

MOUNTING POSITION	ANY	
MAXIMUM OVERALL LENGTH	2 1/8	INCHES
MAXIMUM SEATED LENGTH	1 7/8	INCHES
MAXIMUM DIAMETER	3/4	INCHES
BULB	T-5 1/2	
BASE	SMALL BUTTON MINIATURE 7 PIN E7-1	

RATINGS

ABSOLUTE VALUES

MAXIMUM DC OPERATING CURRENT	3.5	MA.
MINIMUM DC OPERATING CURRENT	1.5	MA.
AMBIENT TEMPERATURE RANGE	-55 TO +90	°C

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

CIRCUIT VALUES

MAXIMUM SHUNT CAPACITOR	.02	μf
SERIES RESISTOR	SEE NOTE BELOW	

NOTE:

A SERIES RESISTOR MUST ALWAYS BE USED WITH THE 5651 IN ORDER TO LIMIT THE CURRENT TO A MAXIMUM OF 3.5 MA AT THE HIGHEST ANODE SUPPLY VOLTAGE AND TO LIMIT THE CURRENT TO A MINIMUM OF 1.5 MA AT THE LOWEST ANODE SUPPLY VOLTAGE.

OPERATING NOTES

THE 5651 VOLTAGE REFERENCE TUBE HAS BEEN DESIGNED TO GIVE EXTREMELY STABLE TUBE VOLTAGE DROPS AT SPECIFIC CURRENTS WITHIN THE CURRENT RANGE VALUES. IT ALSO HAS BEEN DESIGNED TO ELIMINATE SUDDEN VOLTAGE JUMPS OR FLUCTUATIONS OVER ITS OPERATING CURRENT RANGE. THE VOLTAGE REGULATION CHARACTERISTIC OF A REFERENCE TUBE IS NOT INDEPENDENT OF THE TUBE CURRENT. THE CHANGE IN TUBE CURRENT THROUGH THE REFERENCE TUBE SHOULD BE LIMITED TO A PERCENTAGE LESS THAN THE ALLOWABLE PERCENTAGE VOLTAGE CHANGE. UNDER THESE CONDITIONS, CHANGES OF THE VOLTAGE DROP ACROSS THE TUBE WILL BE IN MANY CASES LESS THAN 0.2 PERCENT THROUGHOUT THE LIFE OF THE TUBE.

EQUIPMENT DESIGN AND RANGE VALUES

	MINIMUM VOLTS	AVERAGE VOLTS	MAXIMUM VOLTS
DC ANODE SUPPLY VOLTAGE IN DARKNESS	160[A]	---	---
DC ANODE SUPPLY VOLTAGE IN LIGHT	115[A]	---	---
ANODE BREAKDOWN VOLTAGE	---	106	115
TUBE VOLTAGE DROP (1) AT 1.5 MA.	82	84.5	---
TUBE VOLTAGE DROP (2) AT 3.5 MA.	---	86.0	92
REGULATION (1) (1.5 MA TO 3.5 MA.)	---	1.5	3
VOLTAGE JUMP[B]	---	0	0.1

[A] TO ASSURE STARTING THROUGHOUT TUBE LIFE, THE SUPPLY VOLTAGE SHOULD NOT BE LESS THAN THIS VALUE.

[B] DEFINED AS THE MAXIMUM VOLTAGE FLUCTUATION AT ANY CURRENT LEVEL WITHIN THE OPERATING CURRENT RANGE.

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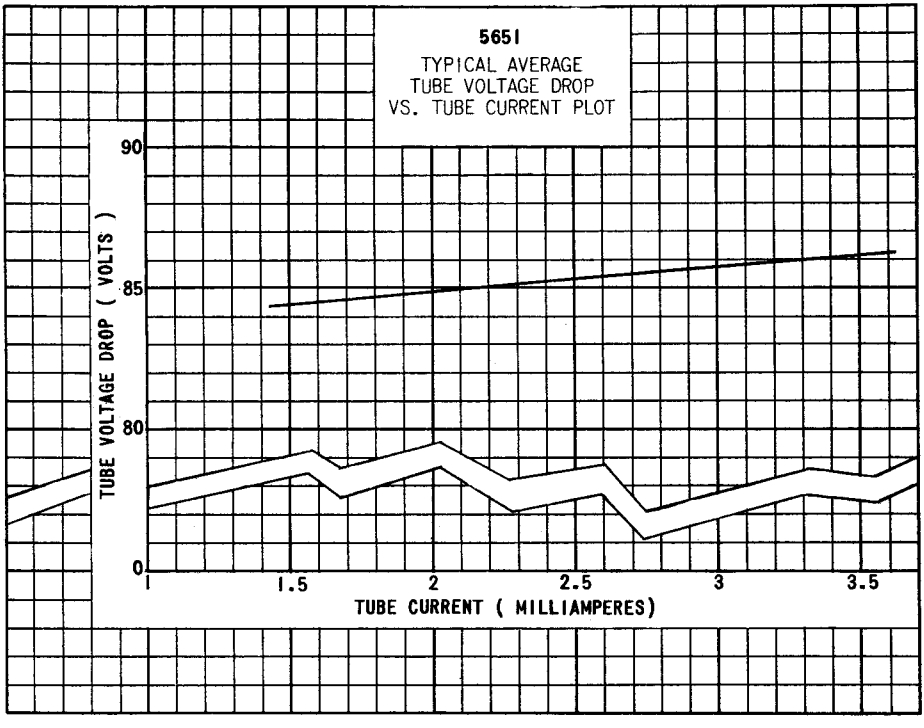

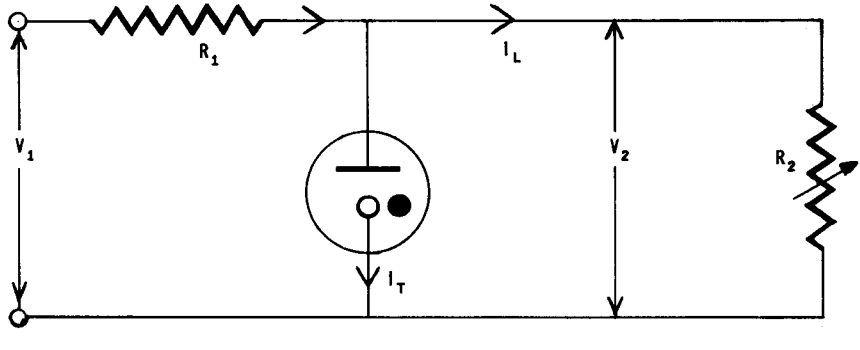

FIGURE 1

TUNG-SOL

TYPICAL APPLICATION CIRCUIT