

Technical Information

CK1057

SUBMINIATURE
TETRODE-TRIGGER
TUBE

The CK1057 is a neon filled cold cathode tetrode designed for use as an indicator lamp in circuits requiring low standby and operating power. The tube has control sensitivity such that it is suitable for use in transistor circuitry. Under typical operating conditions, the light output is several times greater than that obtainable from an NE-2 glow lamp at recommended operating conditions. The flexible terminal leads may be soldered or welded directly to the terminals of circuit components or the leads may be cut, permitting the use of inline subminiature sockets.

ELECTRICAL DATA

<u>Ratings and Normal Operation</u>	<u>MIL-E-1 Symbol</u>	<u>Test Limit or Absolute Minimum</u>	<u>Normal Operation</u>	<u>Test Limit or Absolute Maximum</u>	<u>MIL-E-1 Units</u>
<u>Ratings</u>					
Peak Forward and Inverse Anode Voltage (to cathode or Control grid)	---	---	---	123	v
Anode Supply Voltage (Note A, B)	Ebb	64	68	72	Vdc
DC Anode Current	Ib	---	---	2.0	mAdc
Peak Anode Current	ib	---	---	8.0	ma
Control Grid Supply Voltage	Ic	-10	---	---	Vdc
Keep Alive Cathode Supply Voltage	Ek	-200	-250	-300	Vdc
DC Keep Alive Cathode Current	Ik	---	17	100	μ Adc
<u>Tests</u>					
Anode Current (Ecc = 0, Note A)	Ib	0.8	1.3	1.8	mAdc
Control Grid Supply Voltage (Ebb = 68 Vdc. Note A, E)	Ecc	0	---	-3.0	Vdc
Control Grid Supply Voltage (Ebb = 72 Vdc. Note A, E)	Ecc	0	---	-3.3	Vdc
Anode Voltage (Ecc = 0 Note B, F)	Eb	---	---	61	Vdc
Anode Voltage (Ecc = -10 Vdc Note B, G)	Eb	74	---	---	Vdc
Leakage (Note H)	L1B	---	---	1.0	μ Adc
Leakage (Note I)	L1B	---	---	1.0	μ Adc

CHARACTERISTICS AND TYPICAL OPERATION (Note A)

60 ϕ Anode Supply Voltage (Rectified, full wave, unfiltered) (Note B)	Ebb	68	Vdc
Keep-Alive Cathode Supply Voltage		-250	Vdc
Control Grid Supply Voltage For Anode Conduction		0.0	Vdc
Control Grid Supply Voltage No Anode Conduction		-2.0	Vdc
DC Anode Current	Ib	1.3	mAdc

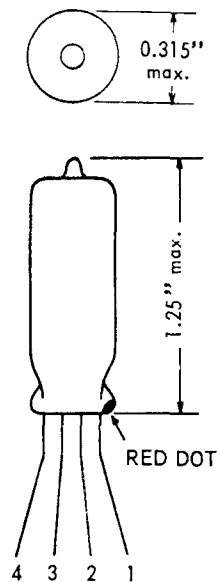
OBJECTIVE DATA

These data identify a particular tube design, and the type designation or the descriptive data may be subject to change or abandonment.

MECHANICAL DATA

ENVELOPE T2
 BASE Pinch Press
 4 Leads in line
 CATHODE Glow Discharge
 MOUNTING POSITION Any

PHYSICAL DIMENSIONS



TERMINAL CONNECTIONS:

Lead 1 Anode
 Lead 2 Keep-alive
 Cathode
 Lead 3 Control grid
 Lead 4 Cathode

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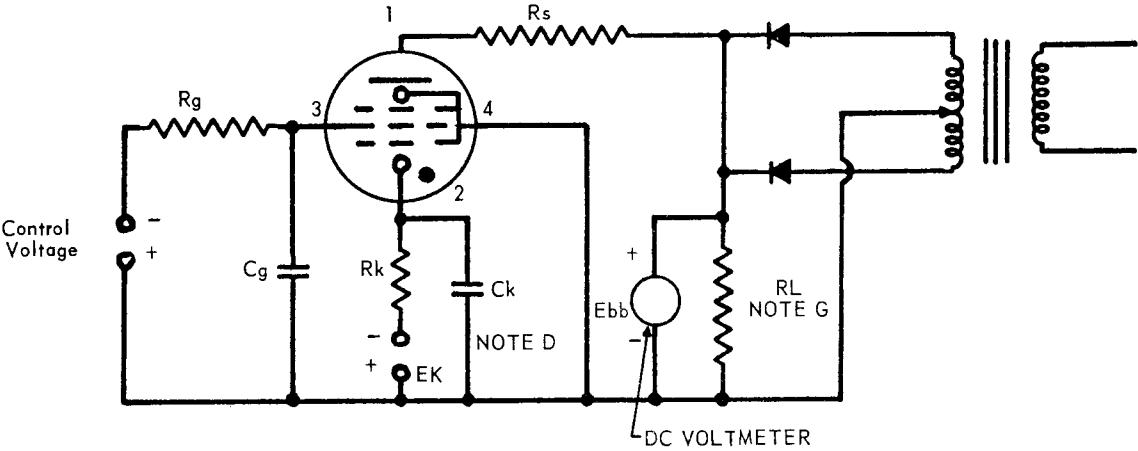
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ELECTRICAL DATA (Cont'd)

CHARACTERISTICS AND TYPICAL OPERATION (Note A) (Cont'd)

DC Keep-Alive Cathode Current	I_k	17	μA_{dc}
Control Grid Series Resistance	R_g	0.1	Meg
Anode Limiting Resistance	R_s	5000	ohms
Keep-Alive Cathode Resistance	R_k	10	Meg
Keep-Alive Cathode Shunt Capacitor (Note D)	C_k	50	$p\text{f}$
Control Grid Shunt Capacitor	C_g	0.001	μf

Note A: The above ratings and operating values refer to operation in the following circuit.



Note B: $E_{bb} = 68 \text{ Vdc}$ is the average of the rectified sine wave whose peak value is $\pi/2$ times 68 volts and is read with a dc Voltmeter.

Note C: To ensure regaining grid control after each positive excursion of anode apply voltage, it is necessary that the minimum positive amplitude of anode supply voltage be low enough to cause deionization each cycle. R_L is chosen to improve regulation as well as to discharge circuit capacitances each cycle.

Note D: Since the critical grid voltage is a function of the keep-alive cathode to ground capacitance, it is recommended that C_k be 50 p f including stray capacitances. Critical grid voltage is also a function of the control grid to ground capacitance and the peak positive anode potential.

Note E: Per MIL-E-1 ref. 4.10.17.1. With $E_{cc} = -10 \text{ Vdc}$ initially and with tube non-conducting, decrease the value of E_{cc} until conduction (visible glow above the top mica) begins. This value of E_{cc} shall be within the limits specified. The glow referred to in this note is in addition to the normal keep-alive (K1) glow.

Note F: Per MIL-E-1 ref. 4.10.17.2 $E_{cc} = 0$. Under the conditions specified the anode voltage shall be increased until the tube conducts a minimum of $50 \mu\text{A}_{dc}$ of anode current with visible glow above the top mica. The anode voltage shall be within the limits specified. The glow referred to in this note is in addition to the normal keep-alive cathode (K1) glow.

Note G: Under the conditions specified the anode voltage shall be increased to 74 Vdc and no anode current in excess of $50 \mu\text{A}_{dc}$ or visible glow in the region above or below the top mica shall occur. For tubes failing this test the value of E_{bb} first indicating glow or in excess of $50 \mu\text{A}_{dc}$ of anode current shall be recorded. The glow referred to in this note is any in addition to the normal keep-alive cathode (K1) glow.

OBJECTIVE DATA

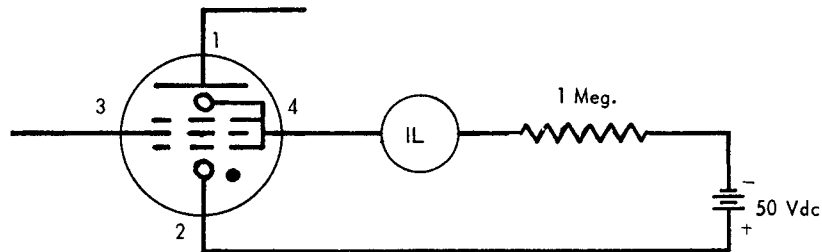
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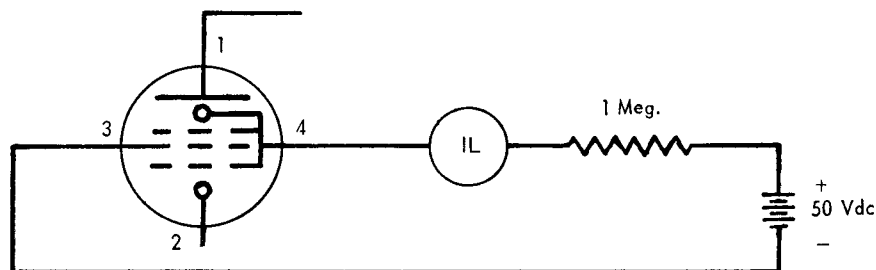
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NOTES: (Cont'd)

Note H: Test the following circuit for Leakage (1) K1 to K2 G1 G3; anode and control grid floating .



Note I: Test in the following circuit for Leakage (2) G2 to K2 G1 G3; anode and keep-alive cathode K1 floating.

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