RAYTHEON

TECHNICAL INFORMATION SERVICE

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

Ratings and Normal Operation	MIL-E-1 Symbol	Test Limit or Absolute Minimum	Normal Operation	Test Limit or Absolute Maximum	MIL-E-1 Units
		Ratings			
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	μAdc
		Tests			
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)	LIB	---	---	1.0	μAdc
Leakage (Note I)	LIB	---	---	1.0	μAdc

CHARACTERISTICS AND TYPICAL OPERATION (Note A)

60~ 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

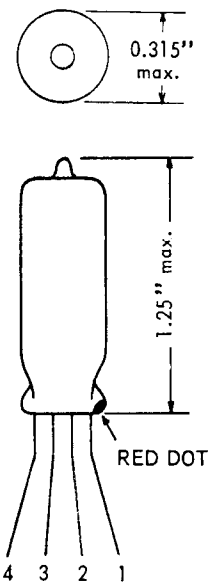
OBJECTIVE DATA

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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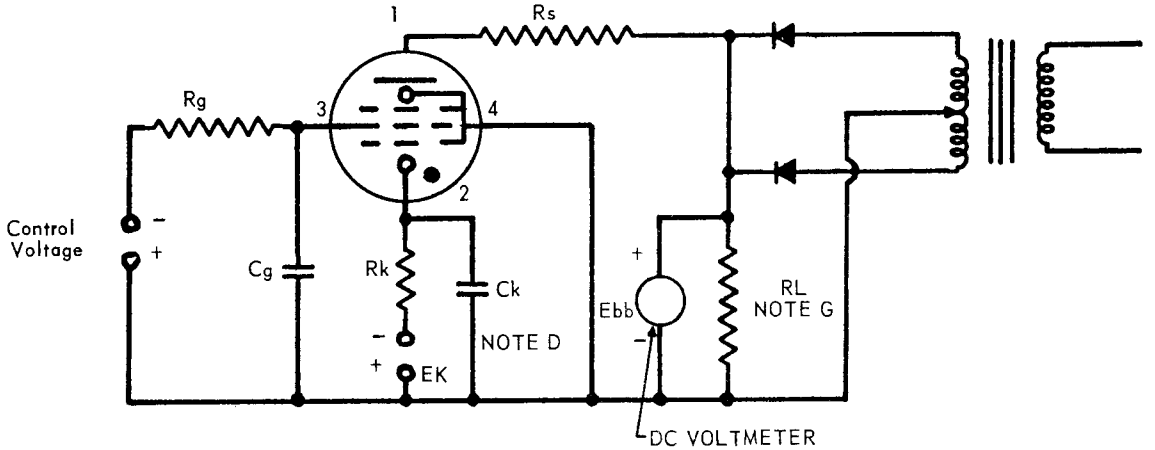
ELECTRICAL DATA (Cont'd)

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

DC Keep-Alive Cathode Current	Ik	17	μAdc
Control Grid Series Resistance	Rg	0.1	Meg
Anode Limiting Resistance	Rs	5000	ohms
Keep-Alive Cathode Resistance	Rk	10	Meg
Keep-Alive Cathode Shunt Capacitor (Note D)	Ck	50	pf
Control Grid Shunt Capacitor	Cg	0.001	μf

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



Note B: Ebb = 68 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. RL 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 CK be 50 pf 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 Ecc = −10 Vdc initially and with tube non-conducting, decrease the value of Ecc until conduction (visible glow above the top mica) begins. This value of Ecc 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 Ecc = 0. Under the conditions specified the anode voltage shall be increased until the tube conducts a minimum of 50 μAdc 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.

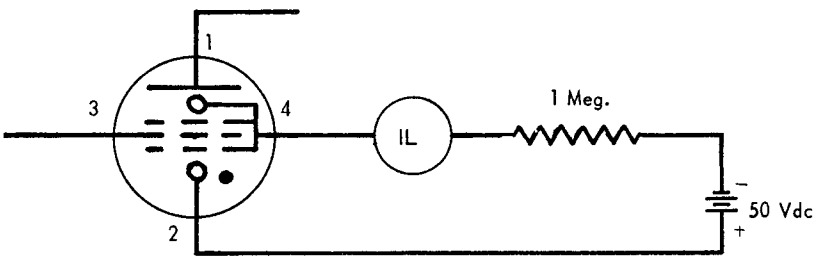
Note G: Under the conditions specified the anode voltage shall be increased to 74 Vdc and no anode current in excess of 50 μAdc or visible glow in the region above or below the top mica shall occur. For tubes failing this test the value of Ebb first indicating glow or in excess of 50 μAdc of anode current shall be recorded. The glow reffered to in this note is any in addition to the normal keep-alive cathode (K1) glow.

OBJECTIVE DATA

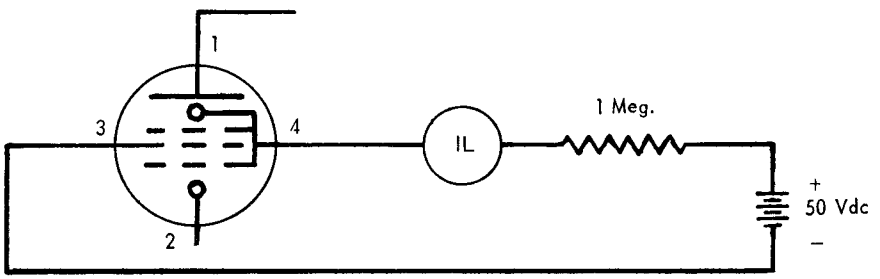
These data identify a particular developmental tube design and the type designation or the descriptive data may be subject to change or abandonment.

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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