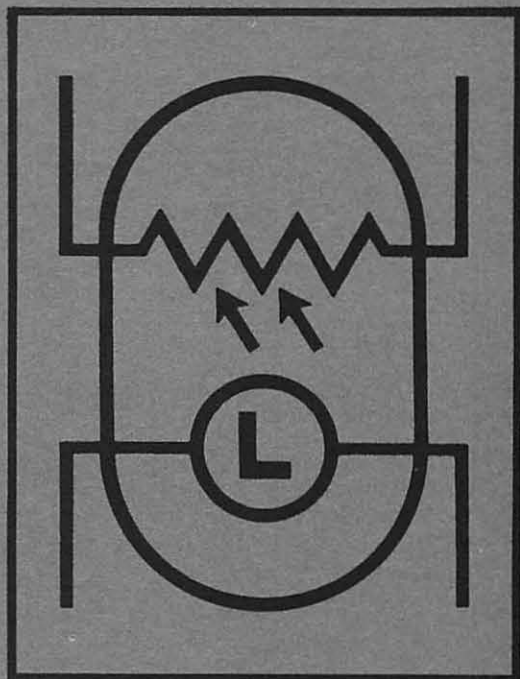




Raysistor[®] optoelectronic devices

TERMINAL
MILC
HL DALLS
METROPOLITAN?



The Raysistor is a four terminal optoelectronic device which performs a variety of control functions, providing noise-free control of AC or DC signals over a wide dynamic range without transients or contact (or wiper) chatter. Since there are no moving parts, Raysistors are exceptionally rugged and have inherently long life in typical applications as variable resistors, solid state switches, relays, and voltage or signal isolators.

Operation of the Raysistor is on the principle of controlled light acting on a photoresistive element. No electrical or mechanical connection exists between the control and signal circuits.



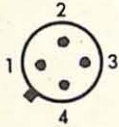
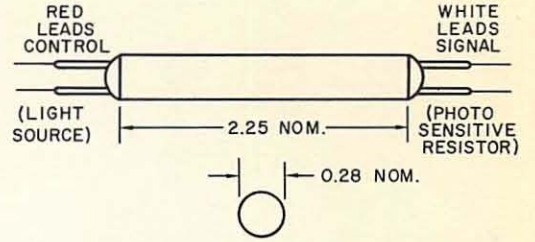
Raysistor[®] optoelectronic devices



CK1101, CK1102, CK1103,
CK1104, CK1111, CK1112

TERMINAL CONNECTIONS

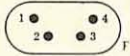
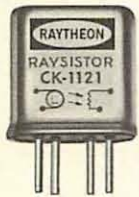
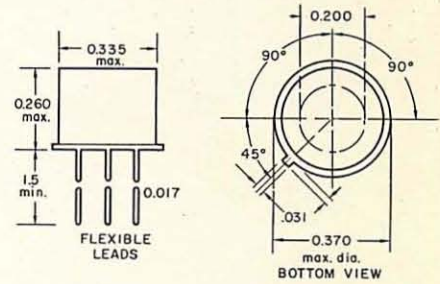
Red leads to control circuit (Light Source)
White leads to signal circuit (Photocell)



CK1114, CK1115, CK1116,
CK2009, CK2010, CK2014,
CK2037, CK2046

TERMINAL CONNECTIONS

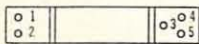
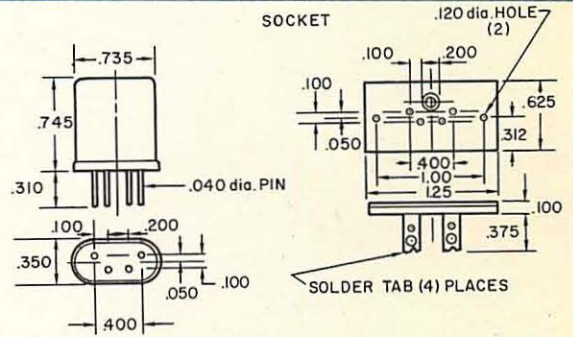
Leads 2 and 4 ..Control Circuit (Light Source)
Leads 1 and 3Signal Circuit (Photocell)



CK1121, CK1122, CK1123,
CK1124, CK2000, CK2003,
CK2006, CK2015, CK2016,
CK2018, CK2019, CK2028,
CK2051, CK2052

TERMINAL CONNECTIONS

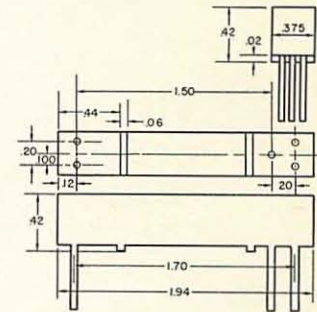
Pins 1, 2 Control Circuit (Light Source)
Pins 3, 4 Signal Circuit (Photoresistor)



CK1101P, CK1102P, CK1103P,
CK1104P, CK1111P, CK1112P, CK2008

TERMINAL CONNECTIONS

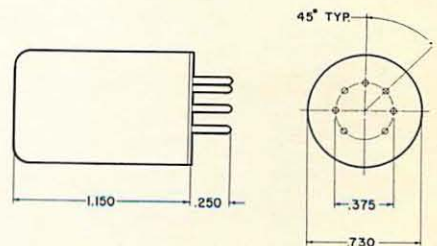
Pins 1, 2 Control Circuit (Light Source)
Pin 3 Shield (Ground)
Pins 4, 5 Signal Circuit (Photocell)



CK2033

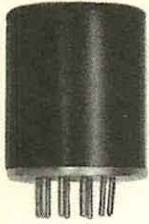
TERMINAL CONNECTIONS

Pin #1 — Lamp Control Pin #4 — NC
Pin #2 — PC #1 Pin #5 — Lamp Control
Pin #3 — PC #1 Pin #6 — PC #2
Pin #7 — PC #2





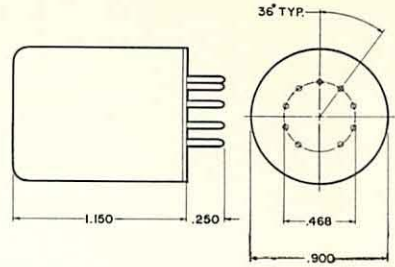
Raysistor[®] optoelectronic devices



CK2042, CK2043

TERMINAL CONNECTIONS

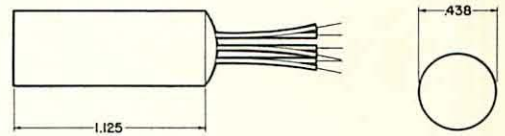
- 9-Pin Header — Epoxy Shell — Design
- | | |
|-----------------------|-----------------------|
| Pin #1 — N.C. | Pin #5 — Control Lamp |
| Pin #2 — PC #1 | Pin #6 — PC #2 |
| Pin #3 — PC #1 | Pin #7 — PC #2 |
| Pin #4 — Control Lamp | Pin #8 — PC #3 |
| Pin #9 — PC #3 | |



CK2034, CK2036

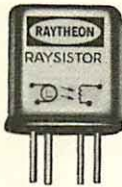
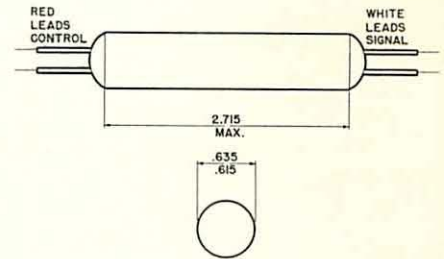
TERMINAL CONNECTIONS

- Epoxy shell Design
- Red Leads — Control Circuit
- Black Leads — PC #1
- White Leads — PC #2



CK2029, CK2032, CK2035

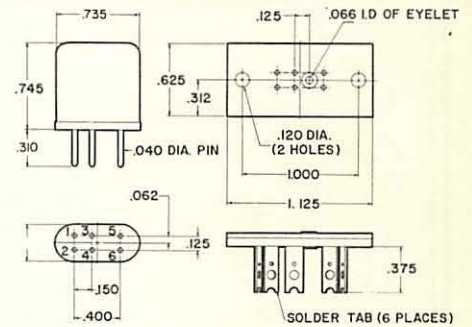
- High Voltage — Flying leads
- Red Leads — Control Circuit (lamp)
- White Leads — Signal Circuit (cell)



CK2020, CK2021

TERMINAL CONNECTIONS

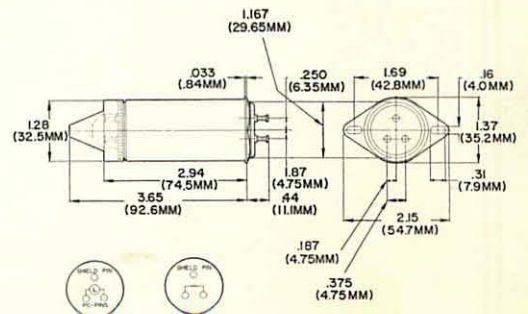
- Crystal Can — 6-pin header
- | | |
|-----------------------|-----------------------|
| Pin #1 — PC #1 | Pin #4 — Lamp Control |
| Pin #2 — PC #1 | Pin #5 — PC #2 |
| Pin #3 — Lamp Control | Pin #6 — PC #2 |



CK1105, CK1108, CK2011, CK2030

- High Voltage — Epoxy Basing
- Red Base — Control Circuit
- Black Base — Signal Circuit

Note: Each set of these terminals is arranged so that the shield pin forms the Apex of the long sides of the triangles.



NOTES FOR CHART AND DIAGRAMS

A. Letter "N" designates a gas discharge type light source; "I" designates an incandescent type light source.

B. Voltage stated is DC or Peak. A current limiting resistor must be used in series with the control lamp. A typical value is 20 K ohms. (100 K ohms for CK1124).

C. The control current is linear with voltage over the stated range. It is possible to operate the light source below the lower limit, but either a constant current source must be used or the supply voltage and series limiting resistor must be increased to improve stability.

D. The nominal "on" resistance is the typical value of resistance of the photocell when the nominal voltage is applied at the control terminals, measured at 25° C. Under these conditions the "on" resistance will not exceed the maximum value indicated.

E. The "off" resistance has a negative temperature coefficient. Typical values of "off" resistance are 100 megohms at 25° C, 20 megohms at +65° C, and 1000 megohms at -55° C, measured with a 50 volt signal voltage.

F. The "on" switching time is defined as the time required for the voltage across the photocell to fall to 10 per cent of its initial value, measured from the instant that maximum rated control voltage is applied to the lamp. It is a function of both the

signal voltage and of the signal circuit load. In general, "switch-on" time decreases with lower signal voltages and decreases with increased load resistance.

G. The "off" switching time is defined as the time required for the voltage across the photocell to rise to 90 per cent of its final value from the instant that maximum rated control voltage is removed from the lamp. It is also a function of both the signal voltage and of the signal circuit load. In general, "switch-off" time decreases with lower signal voltages and increases with increased load resistance.

H. Correct polarity must be observed to realize performance specified. Pin number 1 must be positive with respect to pin number 2.

GENERAL NOTES

Test conditions for switching time:

signal voltage — 50 volts
signal circuit load — 100K ohms

The 100 milliwatt rating on the photocell applies only to room ambient temperatures and below. Maximum dissipation at 65° C is 25 milliwatts.

Switch-on time is dependent upon rate of successive firing of the lamp. Initial switch-on time may vary up to 100 ms. Specified values apply when control circuit is energized at a rate of 2 cps or faster.

	MODEL	CONTROL LAMP		INSULATION DC Peak Volts	SIGNAL - PHOTOCELL					GENERAL				CASE TYPES	
		Voltage	(MA) Current		Resistance (Ohms)		Voltage Max.	Max. Power (MW) ^f	Typical Switch. Time # Sec.		Shunt Cap. (PF)	Coupling Cap. (PF)	Weight (Oz.)		Light Source Type ^g
					Max. On ^d	Min. Off ^e			On ^f	Off ^g					
11.00	CK1101	120 ^a	1-3 ^c	1000	1000	10 ⁷	100	75	.0012	.060	4	.001	.2	N	Metal Tube
10.75	CK1101P	120	1-3 ^c	1000	1000	10 ⁷	100	75	.0012	.060	4	.001	.2	N	Printed Circuit
11.00	CK1102	0-1	0-50	1000	700	10 ⁶	100	75	.020	.300	4	.003	.2	1	Metal Tube
10.75	CK1102P	0-1	0-50	1000	700	10 ⁶	100	75	.020	.300	4	.003	.2	1	Printed Circuit
11.00	CK1103	0-5	0-200	1000	150	10 ⁶	100	75	.020	.800	4	.005	.2	1	Metal Tube
10.75	CK1103P	0-5	0-200	1000	150	10 ⁶	100	75	.020	.800	4	.005	.2	1	Printed Circuit
11.00	CK1104	0-25	0-37	1000	150	10 ⁶	100	75	.010	.450	4	.01	.2	1	Metal Tube
10.75	CK1104P	0-25	0-37	1000	150	10 ⁶	100	75	.010	.450	4	.01	.2	1	Printed Circuit
24.50	CK1105	120 ^a	1-3 ^c	50KV	10K	10 ⁶	300	250	.020	1.0	4.4	1.8	3	N	Molded Case
"	CK1108	0-5	0-200	50KV	250	10 ⁶	300	250	.030	1.0	4.4	1.8	3	1	High Voltage
11.00	CK1112	0-10	0-17	1000	700	10 ⁶	100	75	.030	.400	4	.04	.2	1	Metal Tube Molded
10.75	CK1112P	0-10	0-17	1000	700	10 ⁶	100	75	.030	.400	4	.04	.2	1	Printed Circuit
8.75	CK1114	0-1	0-17	500	850	10 ⁶	100	100	.018	.060	1.5	1.0	.04	1	TO-5
8.75	CK1115	0-4	0-55	500	200	10 ⁷	200	100	.020	.300	2	1.0	.04	1	TO-5
9.35	CK1116	0-4	0-17	500	350	10 ⁷	200	100	.010	.300	2	1.0	.04	1	TO-5
4.00	CK1121	0-5	0-55	500	150	10 ⁷	200	100	.020	.250	2	.1	.1	1	Crystal Can
11	CK1122	0-10	0-17	5000	1000	10 ⁷	200	100	.030	.225	2	.1	.1	1	Crystal Can
11	CK1123	0-25	0-37	500	150	10 ⁷	200	100	.010	.300	2	.1	.1	1	Crystal Can
11	CK1124	150 ^b	2-1.2 ^c	500	3000	10 ⁷	200	100	.005	.100	2	.1	.1	N	Crystal Can
5.00	CK2000	0-25	0-37	500	40	10 ⁶	100	100	.030	.300	2	.5	.1	1	Crystal Can
4.60	CK2003	0-10	0-17	500	225	10 ⁷	150	100	.035	.250	2	.1	.1	1	Crystal Can
11	CK2006	0-12	0-17	500	1500	10 ⁶	150	100	.040	1.5	2	.5	.1	1	Crystal Can CdS.
11.60	CK2008	120 ^a	1-3 ^c	1000	300	10 ⁷	150	100	.0015	.060	4	.001	.2	N	Printed Circuit
9.60	CK2009	0-4	0-55	500	135	10 ⁷	200	100	.020	.300	2	1.0	.04	1	TO-5
23.15	CK2010	0-6	0-25	500	270	10 ⁷	200	100	.020	.300	2	1.5	.04	1	TO-5
27.00	CK2011	0-120	0-25	50KV	300	10 ⁶	250	250	.050	.700	4.4	1.8	3	1	Hi Volt
30.00	CK2014	0-3	0-47	500	500	2 x 10 ⁷	200	100	.050	.700	2	1.0	.04	1	TO-5
4.60	CK2015	0-25	0-37	500	1500	10 ⁸	200	100	.015	.075	2	.5	.1	1	Crystal Can
4.60	CK2016	150 ^b	2-1.2	500	1000	10 ⁶	150	100	.010	.250	2	.1	.1	N	Crystal Can
4.00	CK2018	0-5	0-55	500	150	10 ⁷	200	100	.010	.175	2	.1	.1	1	Crystal Can
4.60	CK2019	0-10	0-17	500	1000	10 ⁶	150	100	.040	1.5	2	.1	.1	1	Crystal Can CdS.
8.00	CK2020	0-10	0-17	500	1500	10 ⁶	150	100	.040	1.5	2	.1	.15	1	1 lamp - Crystal CdS. 2 cells CdSe
8.00	CK2021	0-10	0-17	500	500	10 ⁷	150	100	.040	.250	2	.1	.15	1	1 lamp - Crystal CdS. 2 cells CdSe
6.00	CK2028	0-25	0-37	500	200	10 ⁶	100	100	.050	1.5	2	.5	.1	1	Crystal Can CdS.
18.00	CK2029	0-10	0-35	20KV	2000	10 ⁸	250	250	.020	.160	3	1.0	1.0	1	Hi Volt - Flying Leads
24.50	CK2030	0-10	0-17	50KV	700	10 ⁷	250	250	.040	.450	4.4	1.0	3	1	Hi Volt - Molded Case
18.00	CK2032	0-10	0-17	20KV	420	10 ⁷	250	250	.040	.250	3	1.0	1.0	1	Hi Volt - Flying Leads
5.90	CK2033	0-10	0-17	500	Tracking 3500	10 ⁷	200	100	.050	1.5	2	.1	.9	1	1 lamp - 2 sulfide cells 7 pin header
8.00	CK2034	0-25	0-37	500	300	10 ⁶	100	100	.060	1.4	2	.1	.3	1	1 lamp & 2 cells - epoxy shell-flying leads CdS.
18.00	CK2035	120	1-3 ^c	20KV	1000	10 ⁷	250	200	.010	.125	3	1.0	1.0	N	Hi Volt - Flying Leads
8.00	CK2036	0-10	0-17	500	3000	10 ⁷	200	100	.040	.250	Matched @ 3	± 20% 5K & 500K 1.0	1.0	1	2 cells - 1 lamp - flying leads (epoxy shell)
8.75	CK2037	0-4	0-55	500	1000	10 ⁶	200	100	.040	1.5	2	1.0	.04	1	TO-5 CdS.
7.90	CK2042	0-10	0-17	500	1500	10 ⁶	150	100	.050	1.5	2	1.0	1.2	1	9 pin header - epoxy shell - 1 lamp - 3 cells CdS.
7.90	CK2043	0-25	0-37	500	300	10 ⁶	150	100	.040	1.3	2	1.0	1.2	1	9 pin header - epoxy shell - 1 lamp - 3 cells CdS.
9.60	CK2046	0-1	0-17	500	350	10 ⁶	100	100	.030	.090	1.5	1.0	.04	1	TO-5
4.00	CK2051	0-10	0-17	500	2000	10 ⁶	200	100	.040	.350	2	.1	.1	1	Crystal Can CdS.
4.00	CK2052	0-25	0-37	500	300	10 ⁶	200	100	.018	1.2	2	.1	.1	1	Crystal Can CdS.

RAYTHEON

Regional Sales Offices

CALIFORNIA

Suite 520
2930 West Imperial Highway
Inglewood, California 90303
Tel.: 213-757-0251
TWX: 213-778-0121

120 El Camino Real
San Carlos, California
Tel.: 415-593-1021
TWX: 910-376-4395

FLORIDA

1612 E. Colonial Drive
Orlando, Florida
Tel.: 305-841-5920
TWX: 305-841-3759

ILLINOIS

3158 Des Plaines Avenue
Des Plaines, Illinois
Tel.: 312-296-6677
TWX: 312-296-2313

MARYLAND

104 Roesler Road
Glen Burnie, Maryland
Tel.: 301-761-0450
TWX: 301-761-4322

MASSACHUSETTS

Northeastern Regional Office
20 Seyon Street
Waltham, Massachusetts
Tel.: 617-899-8400, ext. 3611
TWX: 617-894-8590

MINNESOTA

4820 West 77th Street
Minneapolis, Minnesota
Tel.: 612-927-9923
TWX: 612-292-4150

NEW JERSEY

210 Sylvan Avenue
Englewood Cliffs, New Jersey
Tel.: 201-567-4911
TWX: 201-567-6894
(In Manhattan dial 947-6400)

NEW YORK

2360 James Street
Syracuse, New York
Tel.: 315-463-9141
TWX: 315-477-1199

OHIO

333 West First Street
Dayton, Ohio
Tel.: 513-223-8128
TWX: 513-944-0380

TEXAS

Suite 609, Stemmons Tower West
Dallas, Texas
Tel.: 214-631-3745
TWX: 214-631-5958

WASHINGTON, D. C.

1000 Sixteenth Street, N.W.
Washington, D. C.
Tel.: 202-638-5200
TWX: 202-965-0658

CANADA

Raytheon Canada, Ltd.
400 Phillips Street
Waterloo, Ontario, Canada
Tel.: 519-745-6831
TWX: 610-365-3469

COMPONENTS DIVISION • INDUSTRIAL COMPONENTS OPERATION • 465 CENTRE STREET • QUINCY, MASS. 02169