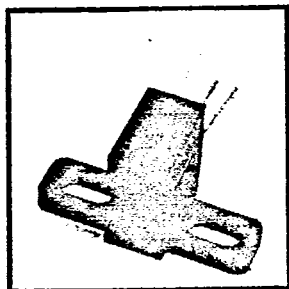


SLOTTED OPTICAL SWITCHES
PHOTO INTEGRATED CIRCUIT

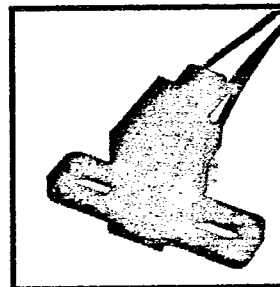
KT930 - KT940 SERIES



Optek Technology, Inc
345 Industrial Blvd.
McKinney, Texas 75069
(214) 542-9461



PACKAGE L



PACKAGE W

DESCRIPTION

The KT930/KT940 series of Photo Integrated Circuit (P.I.C.) Switches provides optimum flexibility for the design engineer. Building from a standard housing with a .125" wide slot, the user can specify (1) type and polarity of TTL output, (2) Lead or wire termination, (3) discrete shell, and (4) aperture width.

The electrical output can be specified as either TTL totem pole or TTL open collector. Either may be supplied with inverter or buffer output polarity. All have the added stability of a built-in hysteresis amplifier.

All housings are an opaque grade of injection-molded polysulfone (P1700-935) to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete shells (exposed only on the parallel faces inside the device throat) are either IR transmissive polysulfone (P1700-1615) for applications where aperture contamination may occur, or opaque polysulfone where maximum protection against ambient radiation is a concern.

The "W" series of switches are terminated with 24 inches of 7 strand, 26 AWG, UL 1429 insulated wire on each terminal. Insulation colors and functions are:

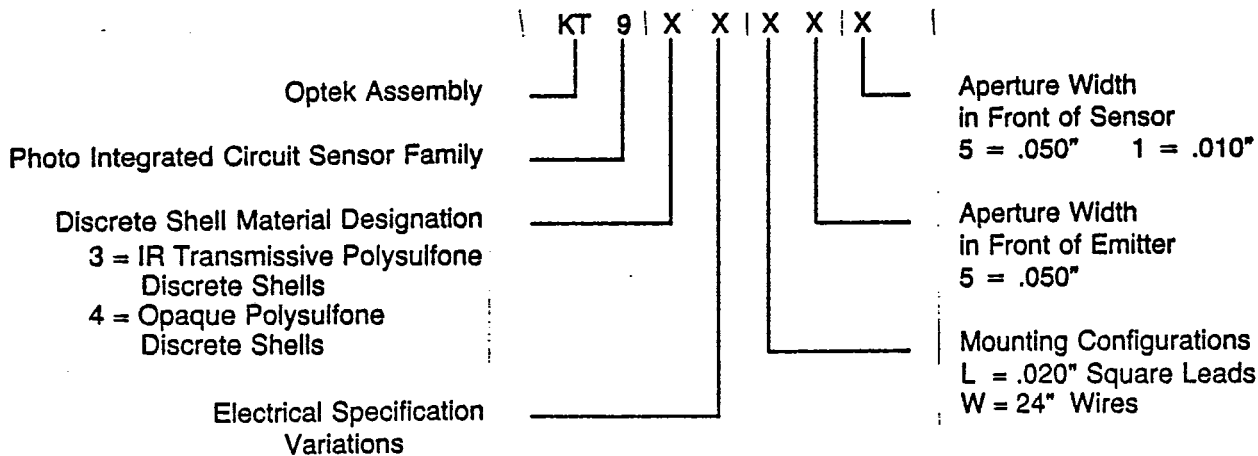
RED - IRED Anode
BLACK - IRED Cathode

WHITE - Vcc
BLUE - Output
GREEN - Ground

Other wire lengths and/or colors are available. Contact your local representative or call the factory.

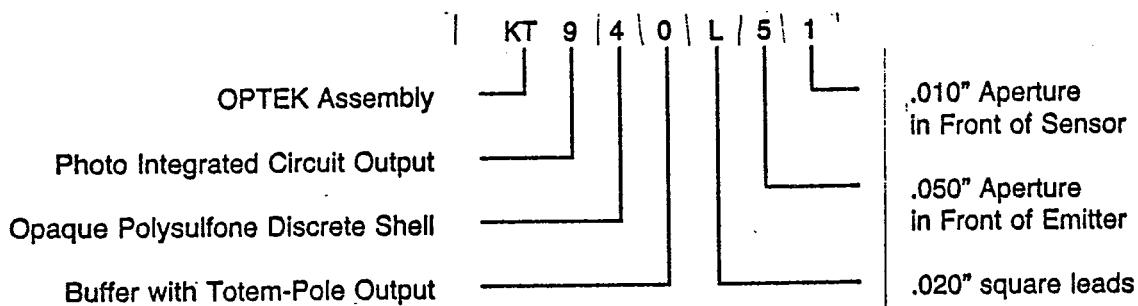
JANUARY 1987

PART NUMBER GUIDE



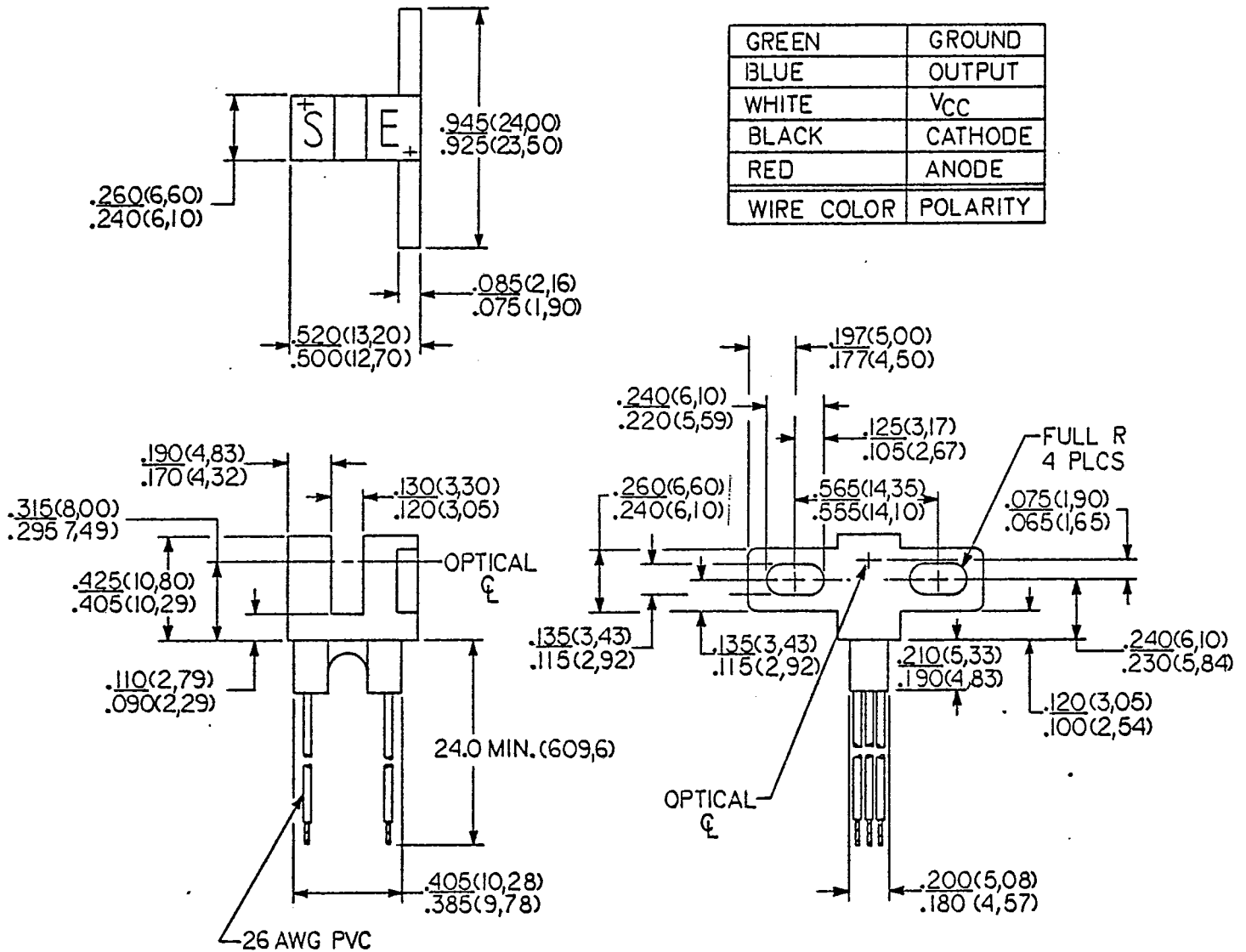
- 0 = Buffer with Totem-Pole Output
- 1 = Buffer with Open-Collector Output
- 2 = Inverter with Totem-Pole Output
- 3 = Inverter with Open-Collector Output

EXAMPLE



OPTEK TECHNOLOGY reserves the right to make changes at anytime without prior notice.

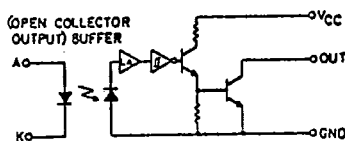
KT930 - KT940 W SERIES



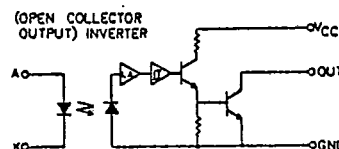
| WIRE COLOR | POLARITY |
|------------|----------|
| GREEN | GROUND |
| BLUE | OUTPUT |
| WHITE | VCC |
| BLACK | CATHODE |
| RED | ANODE |

NOTE:
 Housing is soluble in chlorinated hydrocarbons and ketones.
 Methanol or isopropanol are recommended as a cleaning agent.

KT931/KT941



KT933/KT943

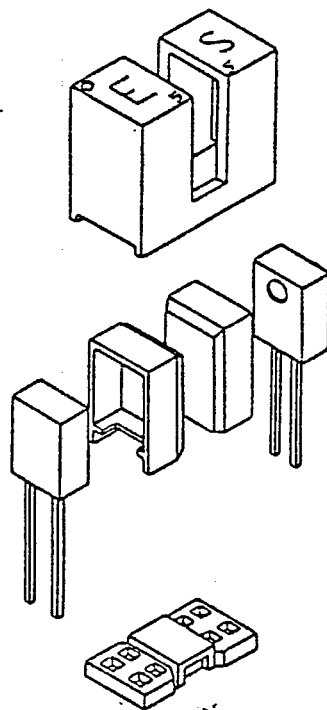


ABSOLUTE MAXIMUM RATINGS (25 °C unless otherwise noted)

| | |
|---|-----------------|
| Supply Voltage, Vcc (Not to exceed 3 seconds) | + 10V |
| Storage Temperature Range | -40°C to +100°C |
| Operating Temperature Range | -40°C to +70°C |
| Lead Soldering Temperature (1/16" from case for 5 seconds with soldering iron) | +240°C |
| Input Diode Power Dissipation | 100 mW (B) |
| Output Photologic Power Dissipation | 200 mW (D) |
| Total Device Power Dissipation | 300 mW (E) |
| Voltage at Output Lead (Open Collector Output) | 35 V |
| Diode Forward D.C. Current | 40 mA |
| Diode Reverse D.C. Voltage | 3 V |

- Notes:
- (A) RMA flux is recommended. Duration can be extended to 10 seconds maximum when soldering.
 - (B) Derate linearly 1.33mW/°C above 25°C
 - (C) Normal application would be with light source blocked, simulated by $I_f = 0$
 - (D) Derate linearly 2.67 mW/°C above 25°C
 - (E) Derate linearly 4.0 mW/°C above 25°C

MECHANICAL CONSTRUCTION



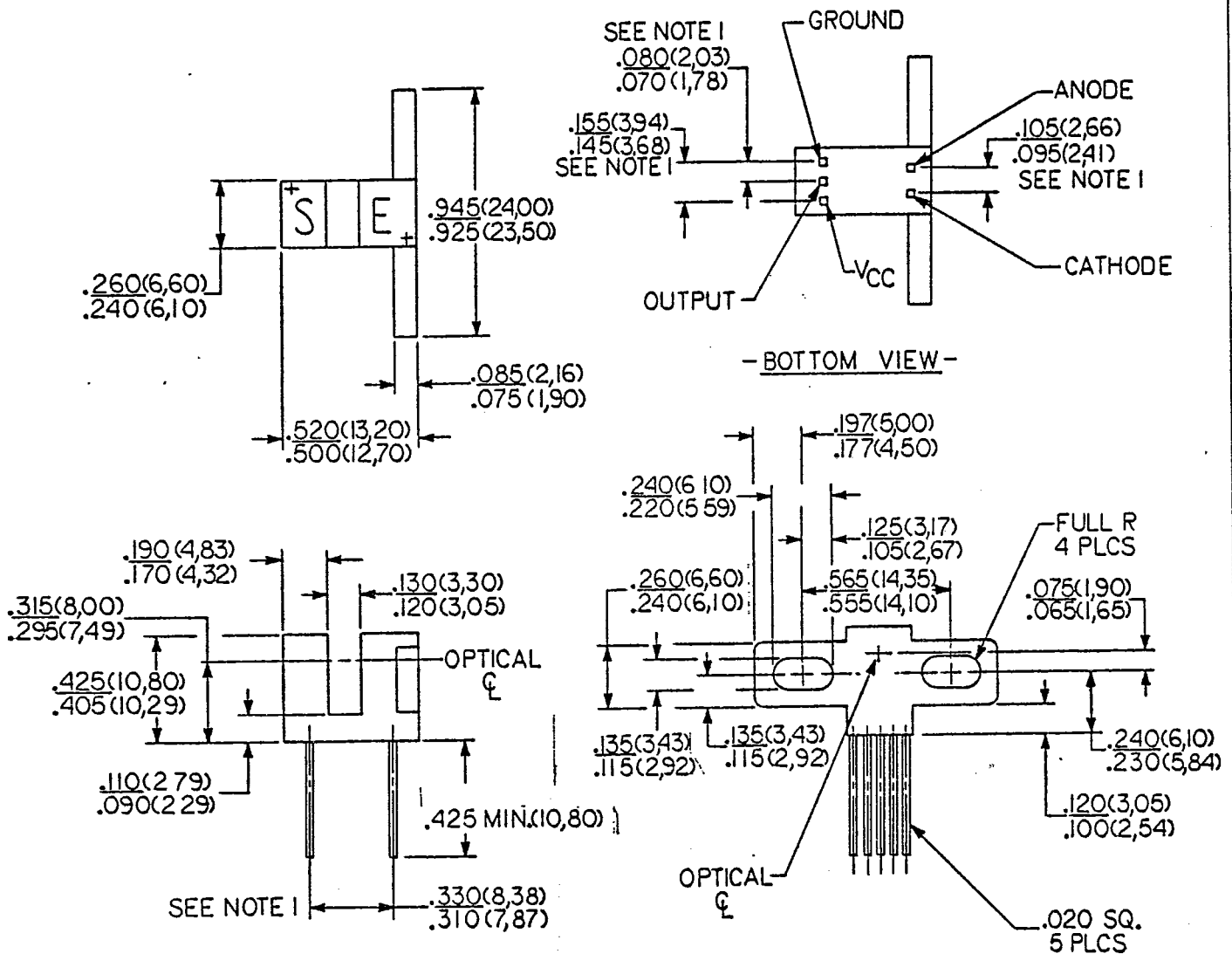
All housings are an opaque grade of injection-molded polysulfone (P1700-935) to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete Shells (exposed only on the parallel faces inside the device throat) are either IR transmissive polysulfone (P1700-1615) for applications where aperture contamination may occur, or opaque polysulfone where maximum protection against ambient radiation is a concern.

TYPES KT930/KT 940 SERIES

ELECTRICAL CHARACTERISTICS (-40°C TO +70°C UNLESS OTHERWISE NOTED)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|--|------------|-----|--------------------------|--------------------------------|--|
| INPUT DIODE | | | | | | |
| V_F | FORWARD VOLTAGE | | | 1.5 | V | $I_F = 20\text{mA}, T_A = 25^\circ\text{C}$ |
| I_R | REVERSE CURRENT | | | 100 | μA | $V_R = 3\text{V}, T_A = 25^\circ\text{C}$ |
| OUTPUT PHOTO INTEGRATED CIRCUIT SENSOR | | | | | | |
| V_{CC} | OPERATING SUPPLY VOLTAGE | 4.75 | | 5.25 | V | |
| I_{CCL} | LOW LEVEL SUPPLY CURRENT: BUFFER WITH TOTEM-POLE OUTPUT BUFFER WITH OPEN-COLLECTOR INVERTER WITH TOTEM-POLE OUTPUT INVERTER WITH OPEN-COLLECTOR | | | 15 15 15 15 | mA mA mA mA | $V_{CC} = 5.25\text{V}, I_F = 0\text{mA}^{(1)}$ $V_{CC} = 5.25\text{V}, I_F = 0\text{mA}^{(2)}$ $V_{CC} = 5.25\text{V}, I_F = 20\text{mA}$ $V_{CC} = 5.25\text{V}, I_F = 20\text{mA}$ |
| I_{CCH} | HIGH LEVEL SUPPLY CURRENT: BUFFER WITH TOTEM-POLE OUTPUT BUFFER WITH OPEN-COLLECTOR INVERTER WITH TOTEM-POLE OUTPUT INVERTER WITH OPEN-COLLECTOR | | | 15 15 15 15 | mA mA mA mA | $V_{CC} = 5.25\text{V}, I_F = 20\text{mA}$ $V_{CC} = 5.25\text{V}, I_F = 20\text{mA}$ $V_{CC} = 5.25\text{V}, I_F = 0\text{mA}^{(1)}$ $V_{CC} = 5.25\text{V}, I_F = 0\text{mA}^{(2)}$ |
| V_{OL} | LOW LEVEL OUTPUT VOLTAGE BUFFER WITH TOTEM-POLE OUTPUT BUFFER WITH OPEN-COLLECTOR INVERTER WITH TOTEM-POLE INVERTER WITH OPEN-COLLECTOR | | | 0.4 0.4 0.4 0.4 | V V V V | $V_{CC} = 4.75\text{V}, I_{OL} = 12.8\text{mA}$ $I_F = 0\text{mA}^{(1)}$ $V_{CC} = 4.75\text{V}, I_{OL} = 12.8\text{mA}$ $I_F = 0\text{mA}^{(2)}$ $V_{CC} = 4.75\text{V}, I_{OL} = 12.8\text{mA}$ $I_F = 20\text{mA}$ $V_{CC} = 4.75\text{V}, I_{OL} = 12.8\text{mA}$ $I_F = 20\text{mA}$ |
| V_{OH} | HIGH LEVEL OUTPUT VOLTAGE BUFFER WITH TOTEM-POLE INVERTER WITH TOTEM-POLE | 2.4 2.4 | | | V V | $V_{CC} = 4.75\text{V}, I_{OH} = 800\mu\text{A}$ $I_F = 20\text{mA}$ $V_{CC} = 4.75\text{V}, I_{OH} = 800\mu\text{A}$ $I_F = 0\text{mA}^{(1)}$ |
| I_{OH} | HIGH LEVEL OUTPUT CURRENT BUFFER WITH OPEN-COLLECTOR INVERTER WITH OPEN-COLLECTOR | | | 100 100 | μA μA | $V_{CC} = 4.75\text{V}, V_{OH} = 30\text{V}$ $I_F = 20\text{mA}$ $V_{CC} = 4.75\text{V}, V_{OH} = 30\text{V}$ $I_F = 0\text{mA}$ $T_A = 25^\circ\text{C}$ |
| $I_{F(+)}$ | LED POSITIVE-GOING THRESHOLD CURRENT | | | 20 | mA | $V_{CC} = 5\text{V}$ |
| $I_{F(+)} I_{F(-)}$ | HYSTERESIS | | 2 | | | $V_{CC} = 5\text{V}$ |
| I_{OS} | SHORT CIRCUIT OUTPUT CURRENT BUFFER WITH TOTEM-POLE INVERTER WITH TOTEM-POLE | -30 -30 | | -100 -100 | mA mA | $V_{CC} = 5.25\text{V}, I_F = 20\text{mA}$ OUTPUT = GND $V_{CC} = 5.25\text{V}, I_F = 0\text{mA}$ OUTPUT = GND |
| T_R, T_F | OUTPUT RISE TIME OUTPUT FALL TIME | | | 70 | ns | $V_{CC} = 5\text{V}, T_A = 25^\circ$ |
| T_{PLH}, T_{PHL} | PROPAGATION DELAY LOW-HIGH & HIGH-LOW | | | 5 | us | $I_F = 0$ or 20 mA $I_F = 0$ or 20 mA $R_L = 8\text{TTL Loads (Totem Pole)}$ $R_L = 360 \Omega$ (Open Collector) |

KT930 - KT940 L SERIES

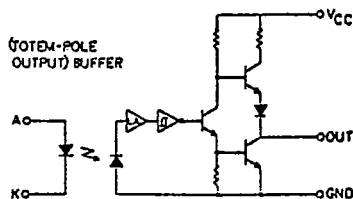


NOTES:

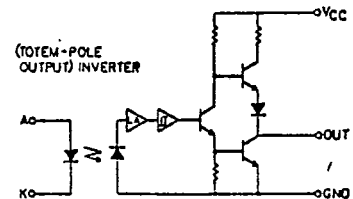
1. Dimension controlled at housing surface only.
2. KT930L thru KT923L and KT940L lead spacing: $.320'' \pm .005''$
3. Housing is soluble in chlorinated hydrocarbons and ketones.
Methanol or isopropanol are recommended as a cleaning agent.

SCHEMATICS

KT 930/KT 940

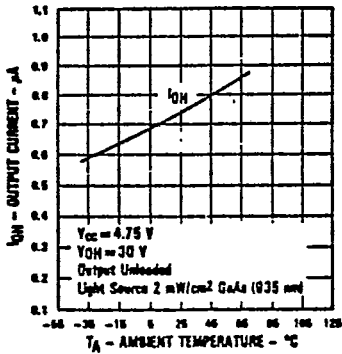


KT932/KT942

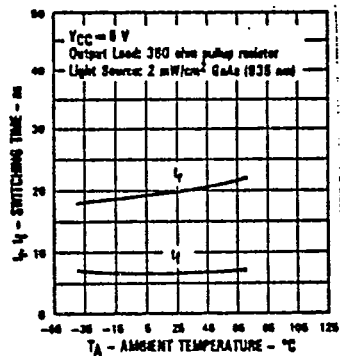


KT930 / KT933 / KT940 / KT943

Output Current (High) vs Ambient Temperature

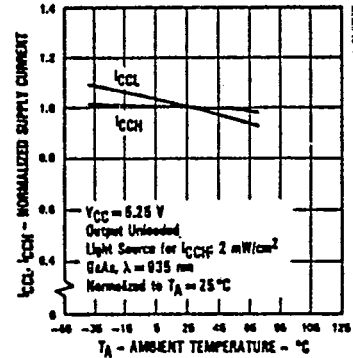


Rise Time and Fall Time vs Ambient Temperature



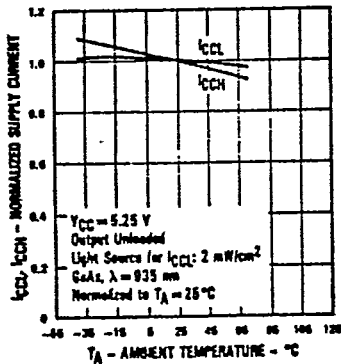
KT930 / KT931 / KT940 / KT941

Normalized Supply Current vs Ambient Temperature



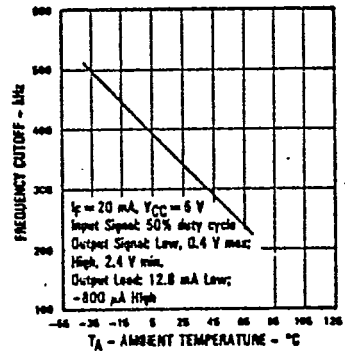
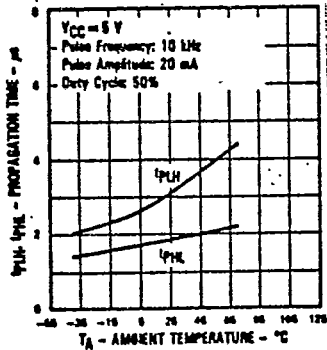
KT932/KT933/KT942/KT943

Normalized Supply Current vs Ambient Temperature



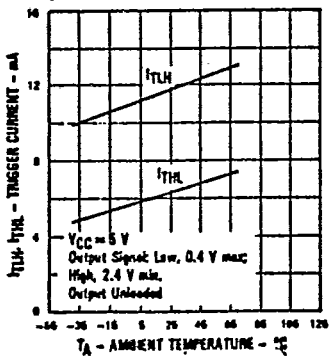
ALL ASSEMBLIES

Propagation Time vs Ambient Temperature

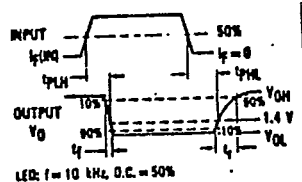


ALL ASSEMBLIES

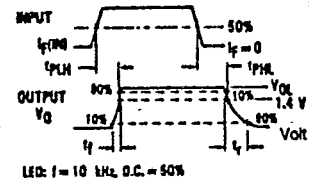
Trigger Current vs Ambient Temperature



Switching Test Curve for Inverters

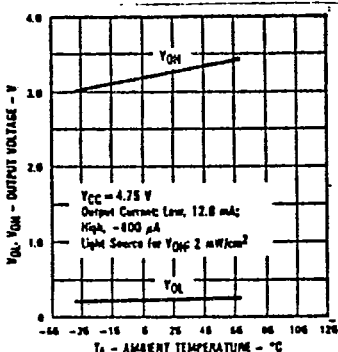


Switching Test Curve for Buffers

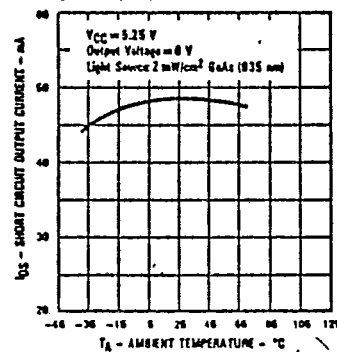


KT930/KT932/KT940/KT942

Output Voltage vs Ambient Temperature



Short Circuit Output Current vs Ambient Temperature



7