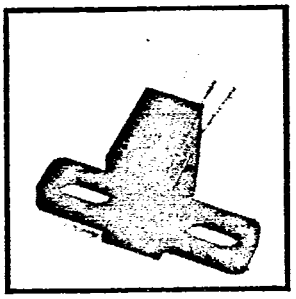
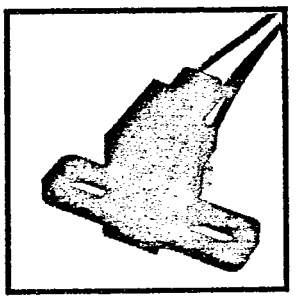
SLOTTED OPTICAL SWITCHES
PHOTO INTEGRATED CIRCUIT

KT930 - KT940 SERIES

OPTEK
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 buffet 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:

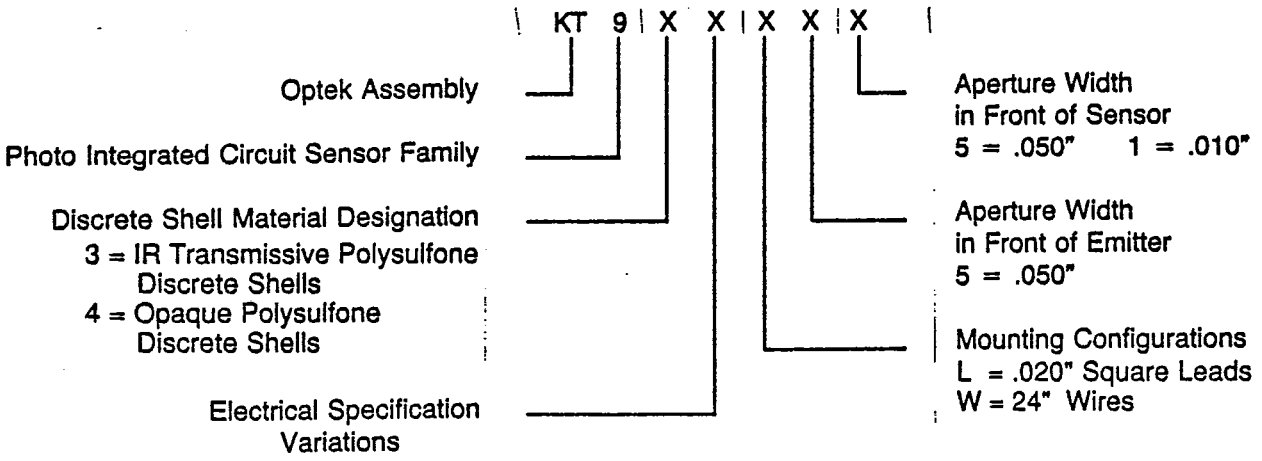
RED - IRED Anode
BLACK - IRED Cathode

WHITE - Vcc
BLUE - Output
GREEN - Ground

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

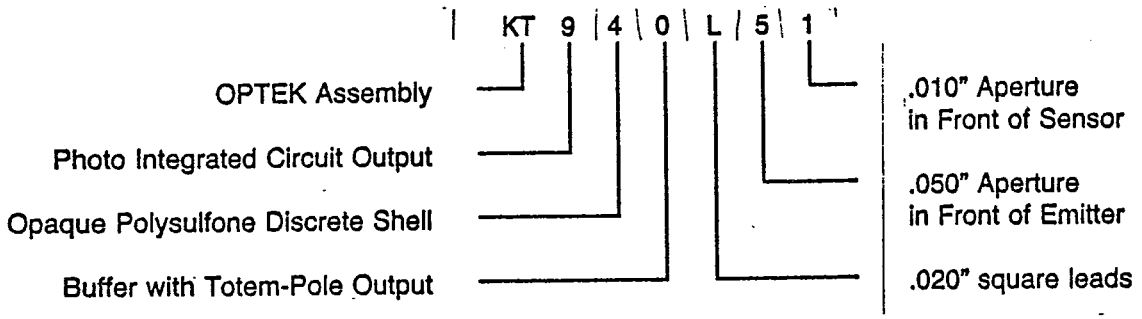
JANUARY 1987

PART NUMBER GUIDE



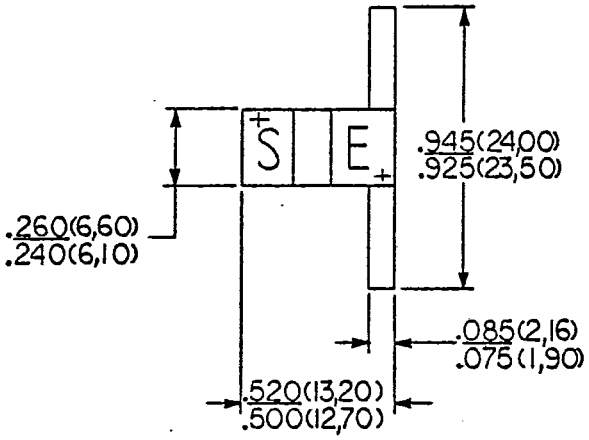
0 = Buffer with Totem-Pole Output
1 = Buffer with Open-Collector Output
2 = Inverter with Totem-Pole Output
3 = Inverter with Open-Collector Output

EXAMPLE

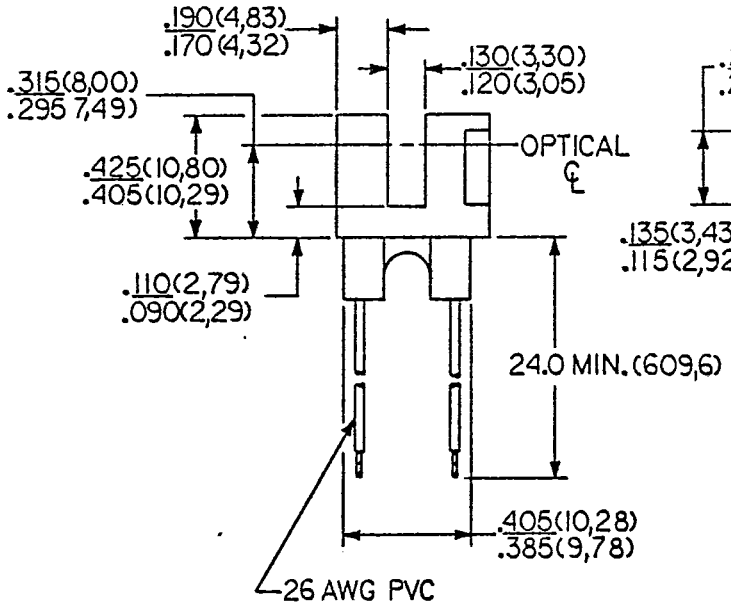


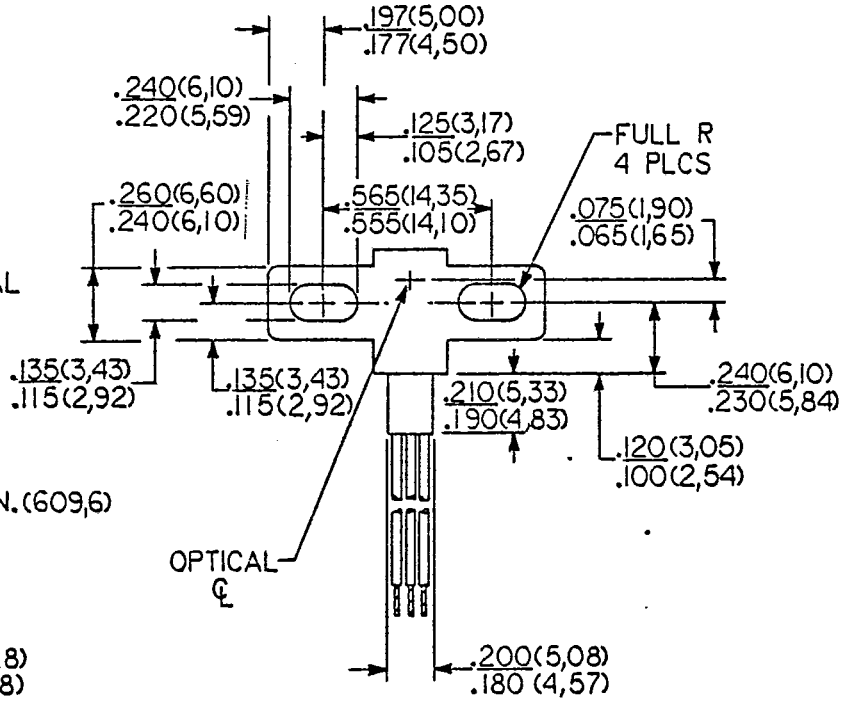
OPTEK TECHNOLOGY reserves the right to make changes at anytime without prior notice.

KT930 - KT940 W SERIES



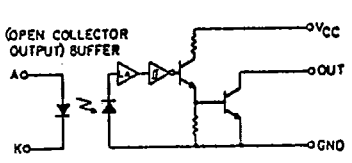
GREEN	GROUND
BLUE	OUTPUT
WHITE	V_{CC}
BLACK	CATHODE
RED	ANODE
WIRE COLOR	POLARITY



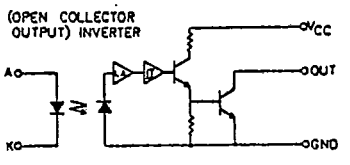


NOTE:
Housing is soluble in chlorinated hydrocarbons and ketones.
Methanol or isopropanol are recommended as a cleaning agent.

KT931/KT941



KT933/KT943

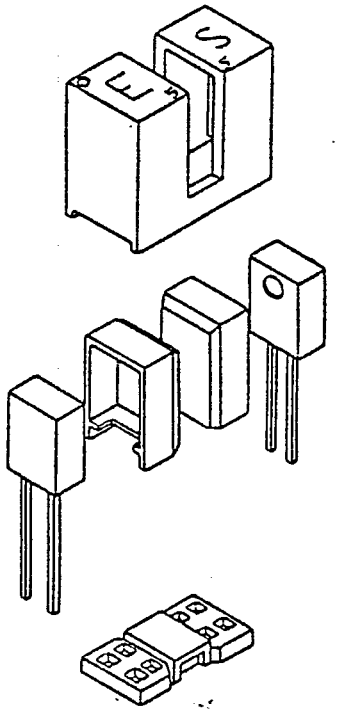


ABSOLUTE MAXIMUM RATINGS (25°C Unless otherwise noted).

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 linerly 1.33mW/°C above 25°C
(C) Normal application would be with light source blocked, simulated by $I_F = 0$
(D) Derate linerly 2.67 mW/°C above 25°C
(E) Derate linerly 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

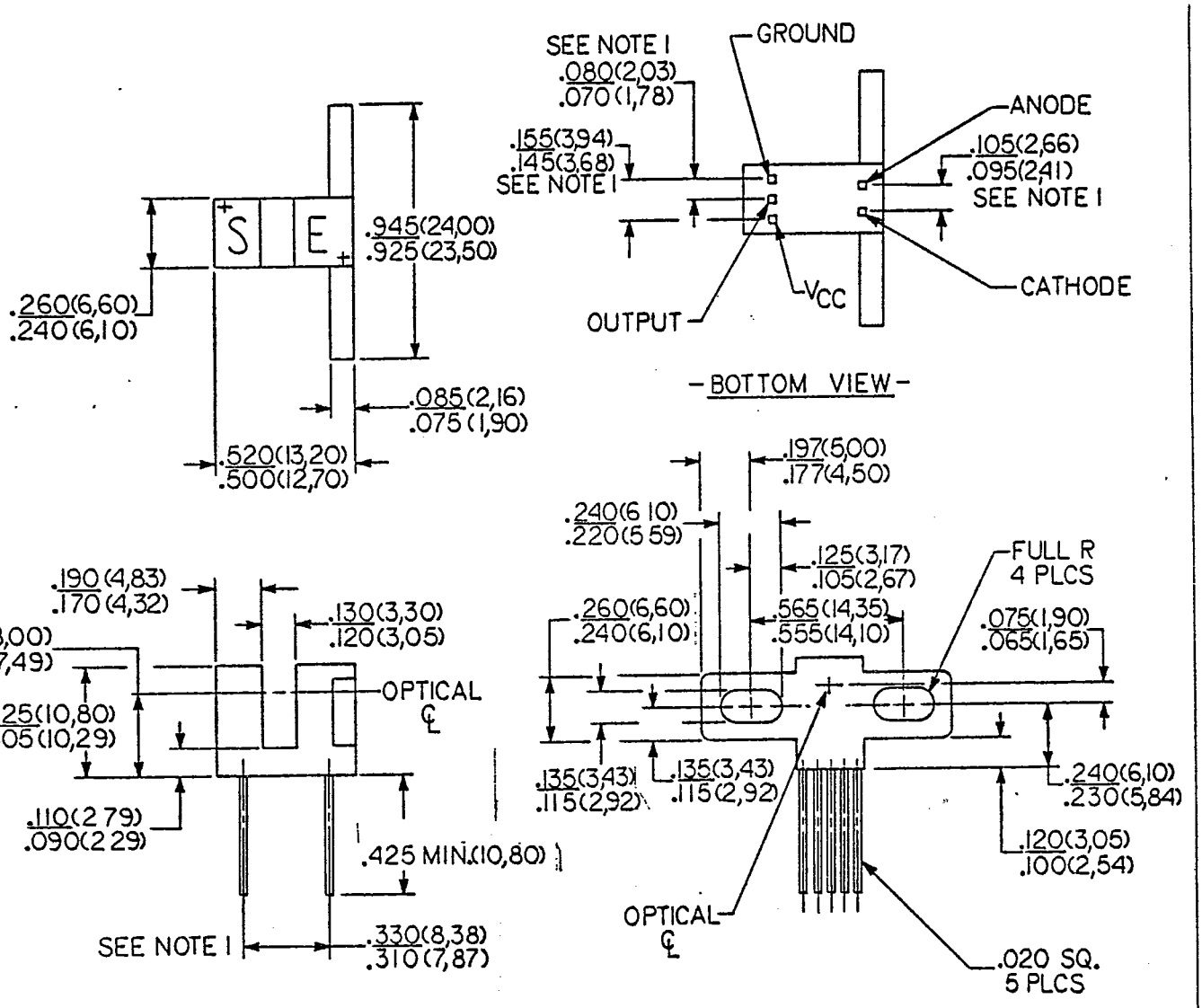
ELECTRICAL CHARACTERISTICS (-40°C TO +70°C UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
INPUT DIODE						
V_F	FORWARD VOLTAGE			1.5	V	I_F = 20mA, T_A = 25°C
I_R	REVERSE CURRENT			100	uA	V_R = 3V, T_A = 25°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			15	mA	V_{CC} = 5.25V, I_F = 0mA(c)
	BUFFER WITH OPEN-COLLECTOR			15	mA	V_{CC} = 5.25V, I_F = 0mA(c)
	INVERTER WITH TOTEM-POLE OUTPUT			15	mA	V_{CC} = 5.25V, I_F = 20mA
	INVERTER WITH OPEN-COLLECTOR			15	mA	V_{CC} = 5.25V, I_F = 20mA
I_{CCH}	HIGH LEVEL SUPPLY CURRENT:					
	BUFFER WITH TOTEM-POLE OUTPUT			15	mA	V_{CC} = 5.25V, I_F = 20mA
	BUFFER WITH OPEN-COLLECTOR			15	mA	V_{CC} = 5.25V, I_F = 20mA
	INVERTER WITH TOTEM-POLE OUTPUT			15	mA	V_{CC} = 5.25V, I_F = 0mA(c)
	INVERTER WITH OPEN-COLLECTOR			15	mA	V_{CC} = 5.25V, I_F = 0mA(c)
V_{OL}	LOW LEVEL OUTPUT VOLTAGE					
	BUFFER WITH TOTEM-POLE OUTPUT			0.4	V	V_{CC} = 4.75V, I_{OL} = 12.8mA, I_F = 0mA(c)
	BUFFER WITH OPEN-COLLECTOR			0.4	V	V_{CC} = 4.75V, I_{OL} = 12.8mA, I_F = 0mA(c)
	INVERTER WITH TOTEM-POLE			0.4	V	V_{CC} = 4.75V, I_{OL} = 12.8mA, I_F = 20mA
	INVERTER WITH OPEN-COLLECTOR			0.4	V	V_{CC} = 4.75V, I_{OL} = 12.8mA, I_F = 20mA
V_{OH}	HIGH LEVEL OUTPUT VOLTAGE					
	BUFFER WITH TOTEM-POLE	2.4			V	V_{CC} = 4.75 V, I_{OH} = 800uA, I_F = 20mA
	INVERTER WITH TOTEM-POLE	2.4			V	V_{CC} = 4.75 V, I_{OH} = 800uA, I_F = 0mA(c)
I_{OH}	HIGH LEVEL OUTPUT CURRENT					
	BUFFER WITH OPEN-COLLECTOR			100	uA	V_{CC} = 4.75 V, V_{OH} = 30V, I_F = 20mA
	INVERTER WITH OPEN-COLLECTOR			100	uA	V_{CC} = 4.75 V, V_{OH} = 30V, I_F = 0mA T_A = 25°C
$I_{F(+)}$	LED POSITIVE-GOING THRESHOLD CURRENT			20	mA	V_{CC} = 5V
$I_{F(+)}$ $I_{F(-)}$	HYSTERESIS		2			V_{CC} = 5V
I_{OS}	SHORT CIRCUIT OUTPUT CURRENT					
	BUFFER WITH TOTEM-POLE	-30|		-100|	mA	V_{CC} = 5.25V, I_F = 20mA, OUTPUT = GND
	INVERTER WITH TOTEM-POLE	-30|		-100|	mA	V_{CC} = 5.25V, I_F = 0mA, OUTPUT = GND
T_R, T_F	OUTPUT RISE TIME OUTPUT FALL TIME			70	ns	V_{CC} = 5V, T_A = 25°
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 = 8TTL Loads (Totem Pole), R_L = 360 Ω (Open Collector)

5

FOR NOTES SEE PAGE 6

KT930 - KT940 L SERIES

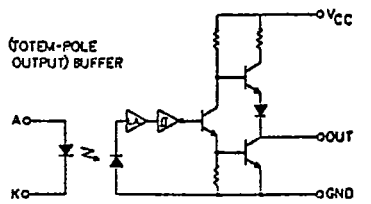


NOTES:

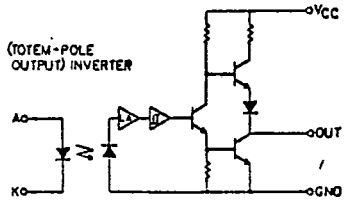
1. Dimension controlled at housing surface only.
2. KT930L thru KT923L and KT940L lead spacing: .320" +/- .005"
3. Housing is soluble in chlorinated hydrocarbons and ketones. Methanol or isopropanol are recommended as a cleaning agent.

SCHEMATICS

KT 930/KT 940



KT932/KT942

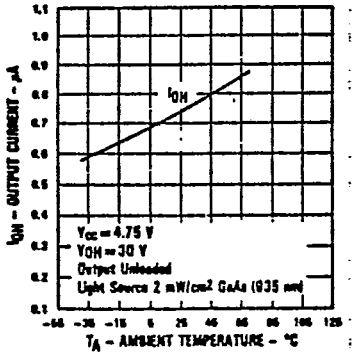


TYPICAL PERFORMANCE CURVES

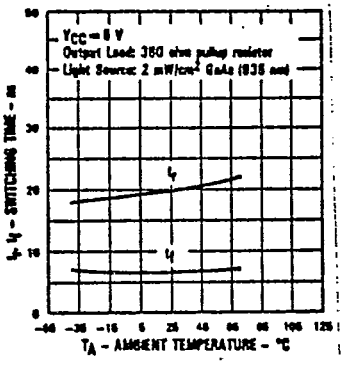
T-41-73

KT930 / KT933 / KT940 / KT943

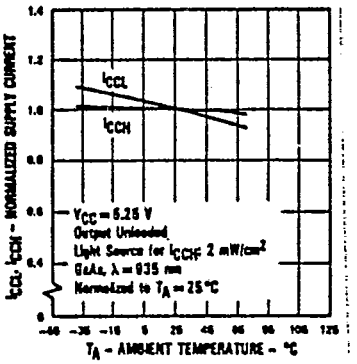
Output Current (High) vs Ambient Temperature



Rise Time and Fall Time vs Ambient Temperature



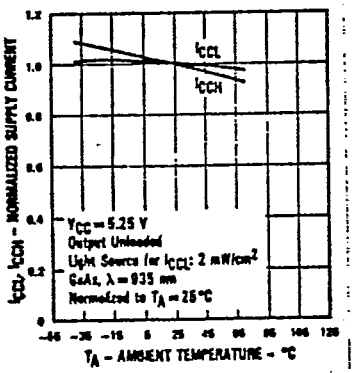
Normalized Supply Current vs Ambient Temperature



KT930 / KT931 / KT940 / KT941

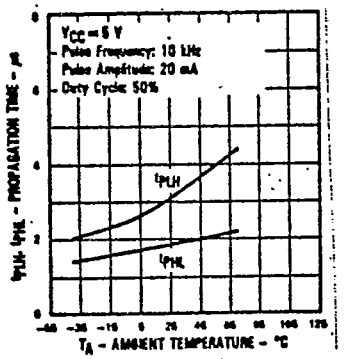
KT932/KT933/KT942/KT943

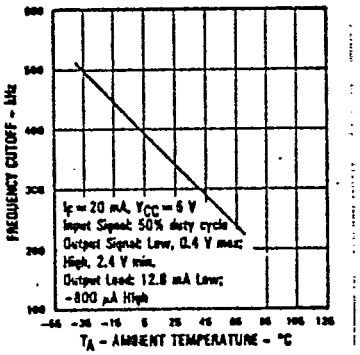
Normalized Supply Current vs Ambient Temperature



ALL ASSEMBLIES

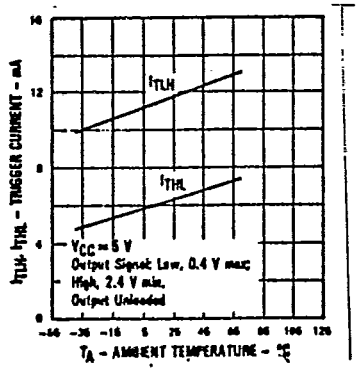
Propagation Time vs Ambient Temperature



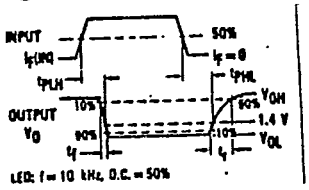


ALL ASSEMBLIES

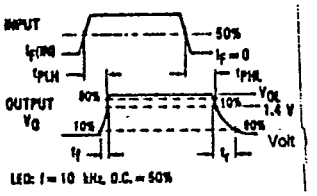
Trigger Current vs Ambient Temperature



Switching Test Curve for Inverters

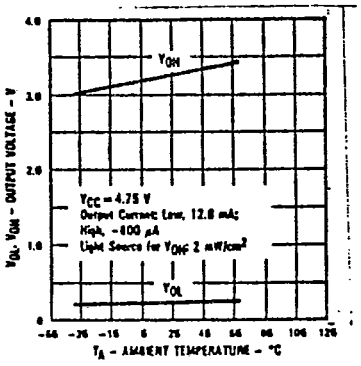


Switching Test Curve for Buffers



KT930/KT932/KT940/KT942

Output Voltage vs Ambient Temperature



Short Circuit Output Current vs Ambient Temperature