

OPTEK TECHNOLOGY INC

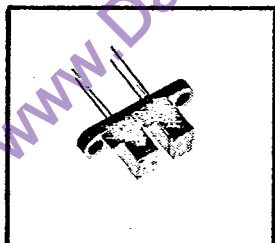
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SLOTTED OPTICAL SWITCHES PHOTO INTEGRATED CIRCUIT

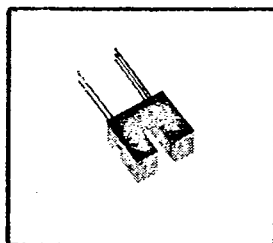


Optek Technology, Inc.
345 Industrial Blvd.
McKinney, Texas 75069
(214) 542-9461

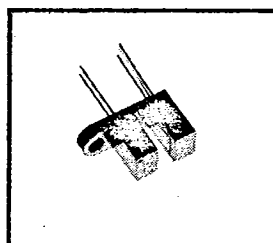
KT 960/970/980/990 SERIES



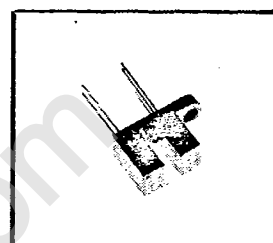
PACKAGE T



PACKAGE N



PACKAGE



PACKAGE P

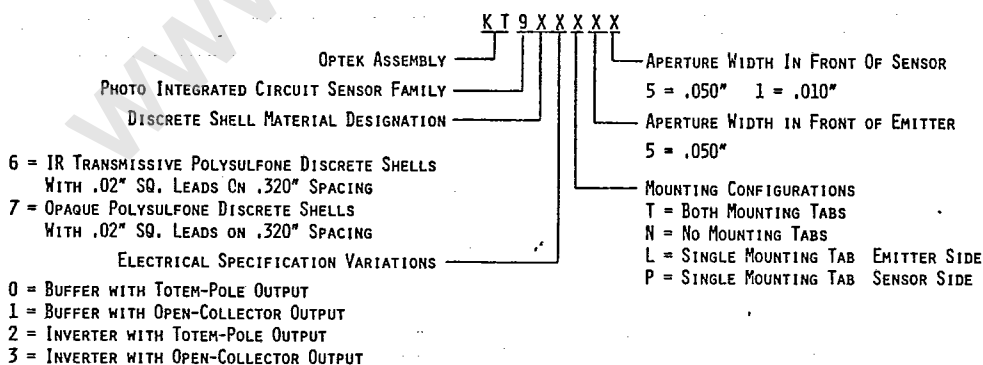
DESCRIPTION

The KT960/970 series of Photo Integrated Circuit (P.I.C.) Switches provides optimum flexibility for the design engineer. Building from a standard housing of .125" wide slot, the user can specify (1) type and polarity of TTL output, (2) mounting tab configuration, (3) discrete shell, and (4) aperture widths.

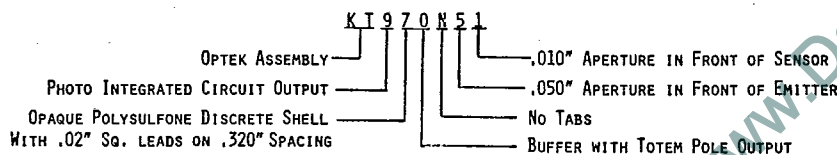
The electrical output can be specified as either TTL totem pole or TTL open collector. Either may be supplied with inverter or buffer output polarity. All have the added stability of a built in hysteresis amplifier.

All housings are an opaque grade of injection-molded polysulfone (PI700-935) 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 (PI700-1615) for applications where aperture contamination may occur, or opaque polysulfone where maximum protection against ambient radiation is a concern.

PART NUMBER GUIDE

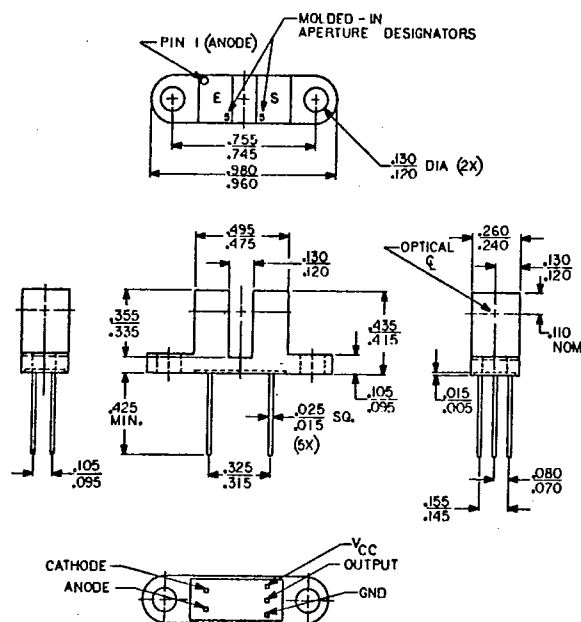


EXAMPLE

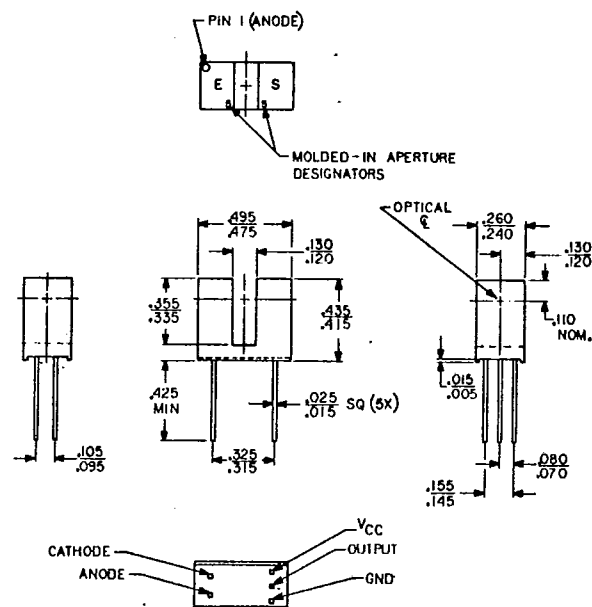


PACKAGE CONFIGURATION

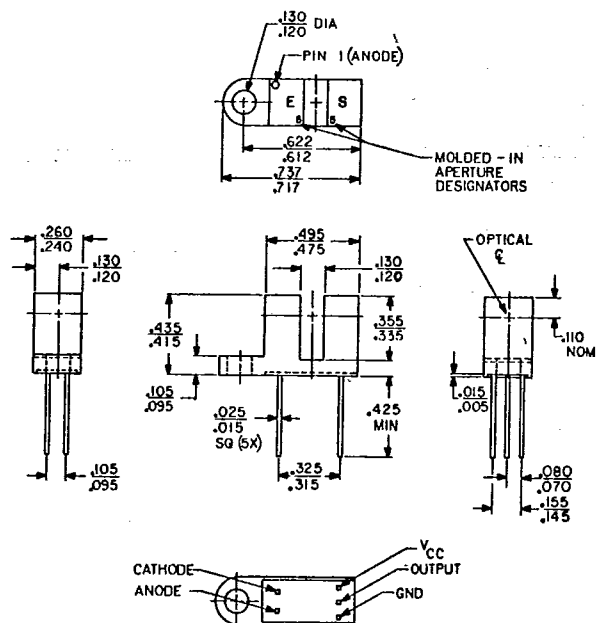
PACKAGE T



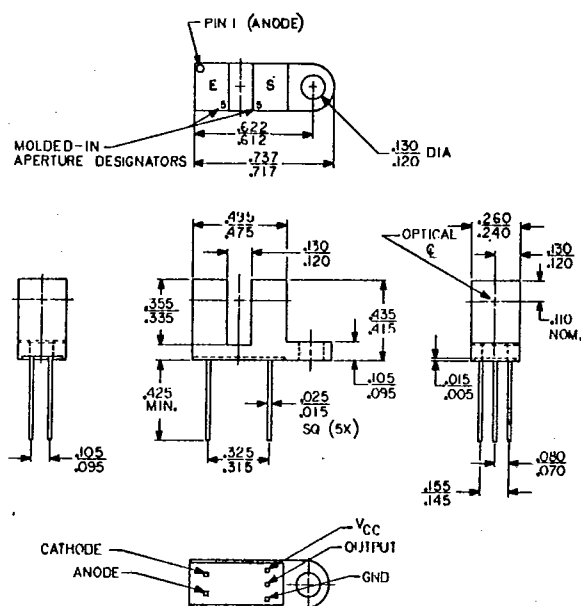
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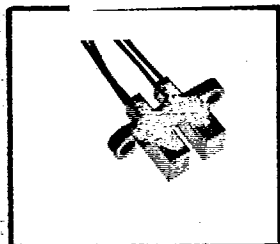


PACKAGE L

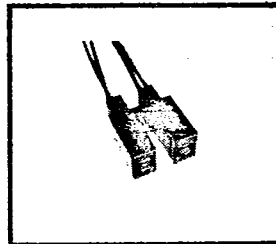


PACKAGE P

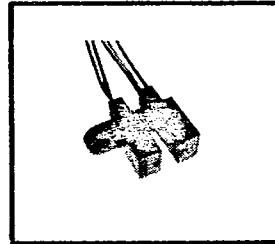




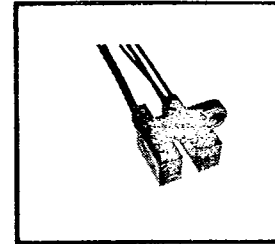
PACKAGE T



PACKAGE N



PACKAGE L



PACKAGE P

DESCRIPTION

The KT980/990 series of Photo Integrated Circuit (P.I.C.) Switches provides optimum flexibility for the design engineer. Building from a standard housing of .125" wide slot, the user can specify (1) type and polarity of TTL output, (2) mounting tab configuration, (3) discrete shell, and (4) aperture widths.

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.

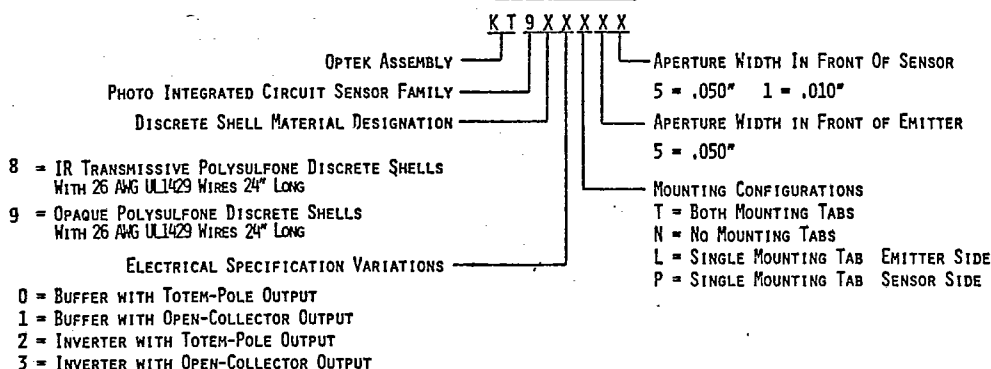
Each terminal of the devices in this series is terminated with 24 inches of 7 strand 26 AWG, UL1429 insulated wire. Insulation colors and functions are:

Red - IRED Anode
Black - IRED Cathode

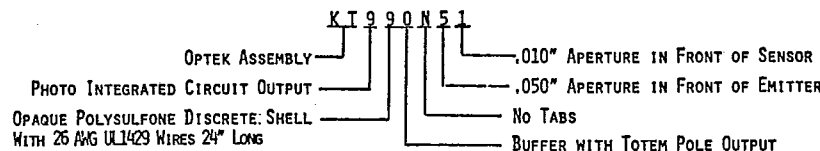
White - V_{CC}
Blue - Output
Green - Ground

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

PART NUMBER GUIDE

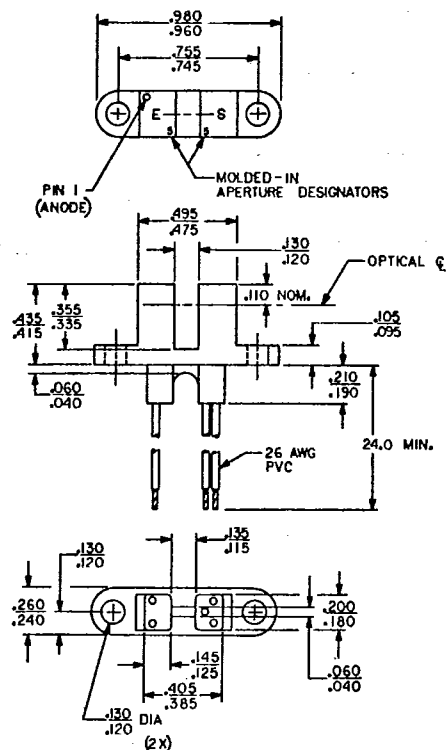


EXAMPLE

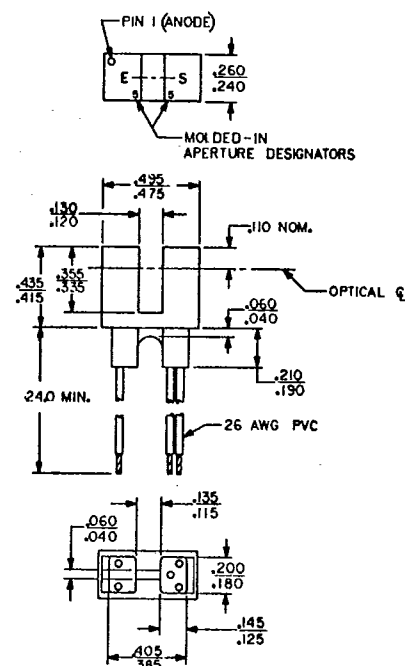


PACKAGE CONFIGURATION

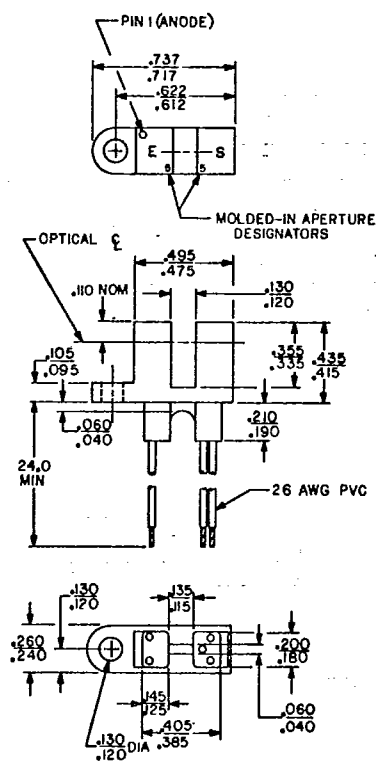
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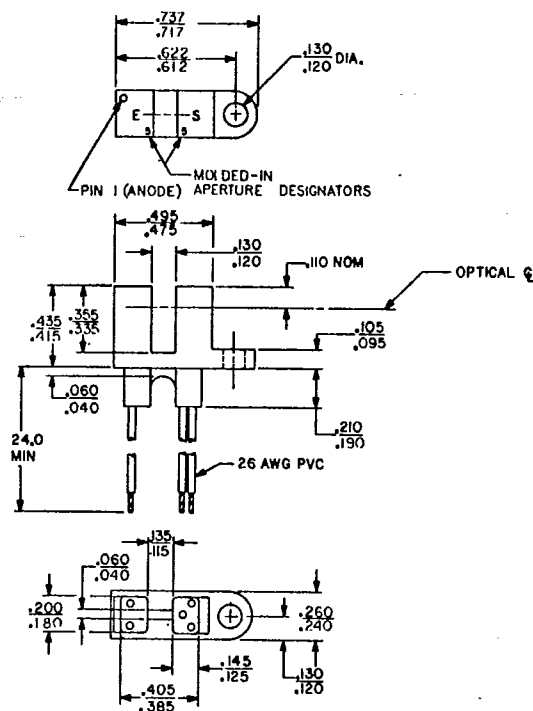
PACKAGE N



PACKAGE L



PACKAGE P



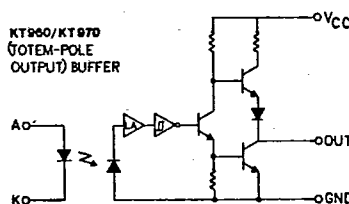
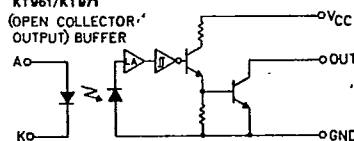
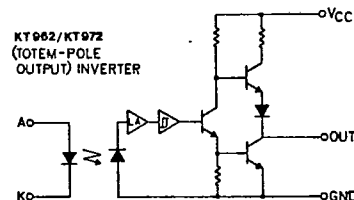
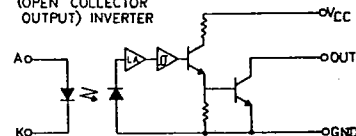
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TYPES KT 960 / KT 970 / KT 980 / KT 990 SERIES

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

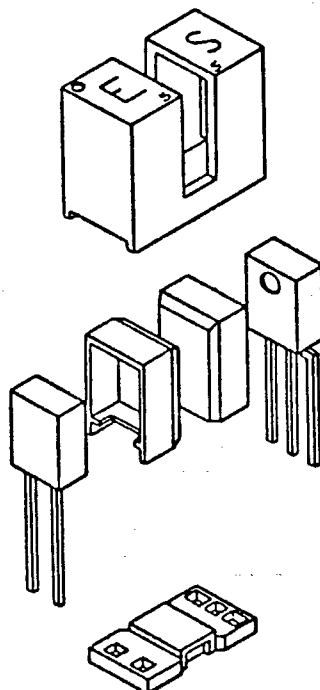
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
INPUT DIODE						
V_F	FORWARD VOLTAGE			1.5	V	$I_F = 20 \text{ mA}$, $T_A = 25^\circ \text{C}$
I_R	REVERSE CURRENT			100	μA	$V_R = 3 \text{ V}$, $T_A = 25^\circ \text{C}$
OUTPUT PHOTO INTEGRATED CIRCUIT SENSOR						
V_{CC} I_{CCL}	OPERATING SUPPLY VOLTAGE LOW LEVEL SUPPLY CURRENT: BUFFER WITH TOTEM-POLE OUTPUT BUFFER WITH OPEN-COLLECTOR INVERTER WITH TOTEM-POLE OUTPUT INVERTER WITH OPEN-COLLECTOR	4.75		5.25	V	$V_{CC} = 5.25 \text{ V}$, $I_F = 0 \text{ mA}^{(C)}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 0 \text{ mA}^{(C)}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 20 \text{ mA}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 20 \text{ mA}$
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	mA	$V_{CC} = 5.25 \text{ V}$, $I_F = 20 \text{ mA}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 20 \text{ mA}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 0 \text{ mA}^{(C)}$ $V_{CC} = 5.25 \text{ V}$, $I_F = 0 \text{ mA}^{(C)}$
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	V	$V_{CC} = 4.75 \text{ V}$, $I_{OL} = 12.8 \text{ mA}$ $I_F = 0 \text{ mA}^{(C)}$ $V_{CC} = 4.75 \text{ V}$, $I_{OL} = 12.8 \text{ mA}$ $I_F = 0 \text{ mA}^{(C)}$ $V_{CC} = 4.75 \text{ V}$, $I_{OL} = 12.8 \text{ mA}$ $I_F = 20 \text{ mA}$ $V_{CC} = 4.75 \text{ V}$, $I_{OL} = 12.8 \text{ mA}$ $I_F = 20 \text{ mA}$
V_{OH}	HIGH LEVEL OUTPUT VOLTAGE BUFFER WITH TOTEM-POLE INVERTER WITH TOTEM-POLE	2.4			V	$V_{CC} = 4.75 \text{ V}$, $I_{OH} = 800 \mu\text{A}$ $I_F = 20 \text{ mA}$ $V_{CC} = 4.75 \text{ V}$, $I_{OH} = 800 \mu\text{A}$ $I_F = 0 \text{ mA}^{(C)}$
I_{OH}	HIGH LEVEL OUTPUT CURRENT BUFFER WITH OPEN-COLLECTOR INVERTER WITH OPEN-COLLECTOR			100	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		-100	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	μs	$I_F = 0$ OR 20 mA $R_L = 8 \text{ TTL LOADS [TOTEM POLE]}$ $R_L = 360 \Omega$ [OPEN COLLECTOR]

SCHEMATICS

KT960/KT970
(TOTEM-POLE
OUTPUT) BUFFERKT961/KT971
(OPEN COLLECTOR
OUTPUT) BUFFERKT982/KT972
(TOTEM-POLE
OUTPUT) INVERTERKT963/KT973
(OPEN COLLECTOR
OUTPUT) INVERTER

Notes: (A) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
(B) Derate linearly 1.33 mW/°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

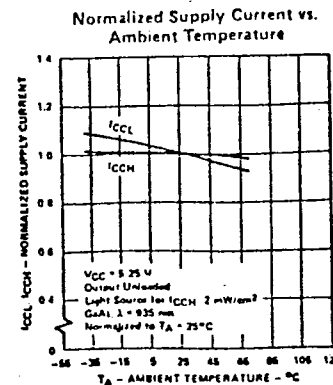
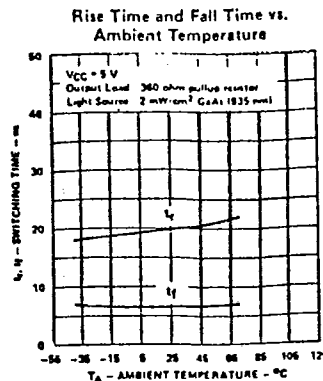
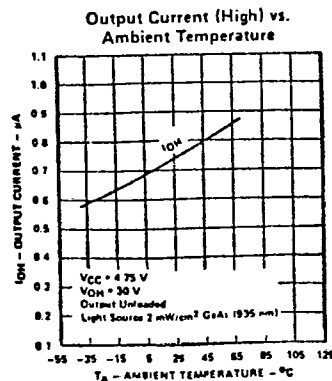


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TYPICAL PERFORMANCE CURVES

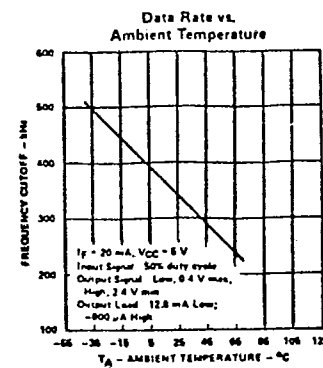
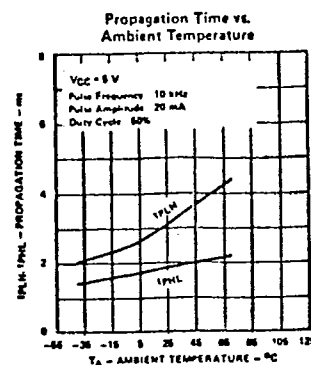
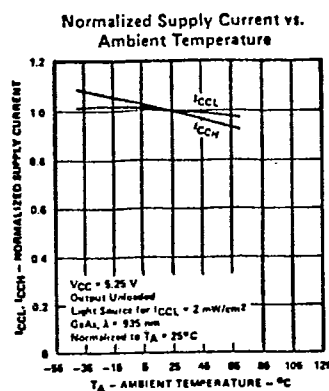
KT961, KT963, KT971, KT973

KT960, KT961, KT970, KT971

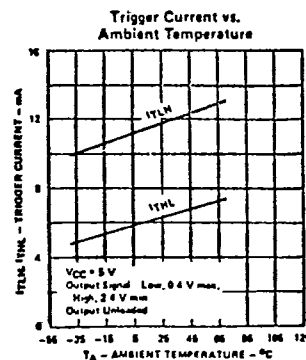


KT962, KT963, KT972, KT973

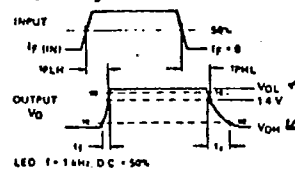
ALL ASSEMBLIES



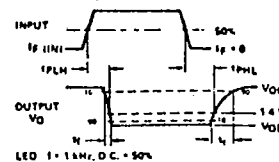
ALL ASSEMBLIES



Switching Test Curve for Buffers



Switching Test Curve for Inverters



KT960, KT962, KT970, KT972

