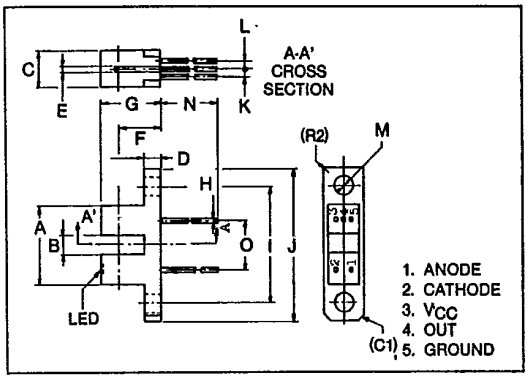
SLOTTED SWITCH

T-41-73

MTSS10010
INFRARED LED+ PHOTO IC

MTSS10010 contains a gallium arsenide infrared emitting diode coupled to a monolithic integrated circuit, which incorporates a photodiode, a linear amplifier and a Schmitt trigger on a single silicon chip.



APPLICATIONS

- OPTICAL SWITCH
- SHAFT POSITION AND VELOCITY SENSOR

FEATURES

- TTL, LSTTL compatible.
- Wide supply voltage (V_{CC}=4.5~16V)
- Non sensitivity for visible light.
- High speed (t_{on} 8μs, t_{off} 5μs typ.)
- Output terminal contains a high voltage limiting diode.

SYMBOL	INCHES	MM
A	0.512±0.010	13±0.25
B	0.118±0.010	3±0.25
C	0.244	6.2
D	0.098±0.010	2.5±0.25
E	0.039	1.0
F	0.270±0.012	6.85±0.3
G	0.394±0.010	10±0.25
H	0.018	0.45
I	0.748±0.010	19±0.25
J	0.984	25.0
K	0.075	1.9
L	0.075	1.9
M	0.130	3.3
N	0.709 MIN	18 MIN
O	0.300	7.62

MAXIMUM RATINGS (Ta = 25°C)

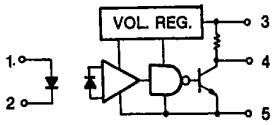
	CHARACTERISTIC	SYMBOL	RATING	UNIT
A	Forward Current	I_F	50	mA
A	Reverse Voltage	V_R	5	V
A	Forward Current Derating	ΔI_F/°C	-0.67	mA/°C
B	Supply Voltage	V_{CC}	16	V
B	Low Level Output Current	I_{OL}	50	mA
B	Total Output Power Dissipation	P_O	250	mW
	Operating Temperature Range	T_{opr}	-25~85	°C
	Storage Temperature Range	T_{stg}	-40~100	°C
	Soldering Temperature and Time	T_{sol}	260°C, 3sec	

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	4.5	5	NOTE	V
Forward Current	I_F	11	13	15	mA
Operating Temperature	T_{opr}	0	—	70	°C

Note: Limited by total output power dissipation.

A - LED B - DETECTOR



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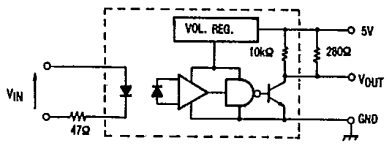
T-41-73

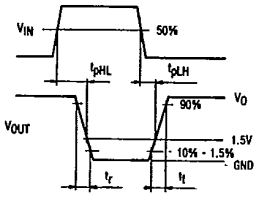
OPTO-ELECTRICAL CHARACTERISTICS (Ta=25°C)
(Over recommended temperature Ta=0~70°C unless otherwise noted.)

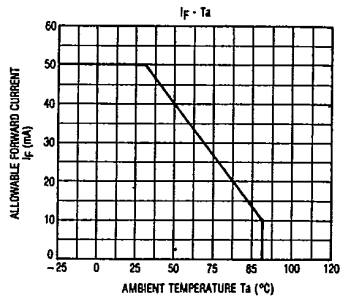
	CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX.	UNIT
A	Forward Voltage		V_F	I_F=8mA	—	1.15	1.4	V
	Reverse Current		I_R	V_R=5V, Ta=25°C	—	—	10	μA
	Capacitance		C_T	V=0, f=1MHz, Ta=25°C	—	30	—	pF
B	Supply Voltage		V_{CC}	Ta=25°C	4.5	—	16	V
	Low Level Supply Current		I_{CCL}	V_{CC}=5V, I_F=8mA	—	6	15	mA
	High Level Supply Current		I_{CCH}	V_{CC}=5V, I_F=0	—	7	20	mA
	Low Level Output Voltage		V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=8mA	—	0.15	0.4	V
	High Level Output Voltage		V_{OH}	V_{CC}=5V, I_F=0	4.0	—	—	V
C	'H→L' LED Threshold Current		I_{FHL}	V_{CC}=5V, Ta=25°C	—	2	5	mA
				V_{CC}=5V	—	—	8	mA
	Hysteresis Ratio		I_{FLH}/I_{FHL}	V_{CC}=5V	—	1.1	—	—
	Propagation Delay	L→H	t_{PLH}	Ta=25°C	—	8	—	μs
	(NOTE)	H→L	t_{PHL}	V_{CC}=5V, I_F=0↔8mA	—	5	—	
	Rise Time (NOTE)		t_r	R_L=280Ω	—	0.1	—	
	Fall Time (NOTE)		t_f	(NOTE)	—	0.05	—	

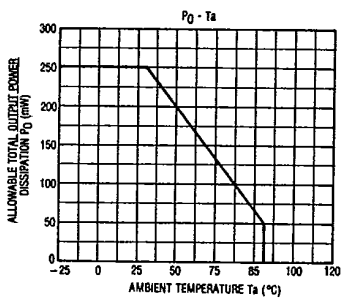
Note: Switching time test circuit and voltage waveform.

A - LED **B** - DETECTOR **C** - COUPLED









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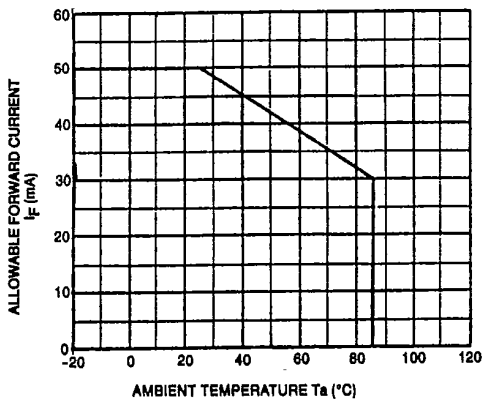
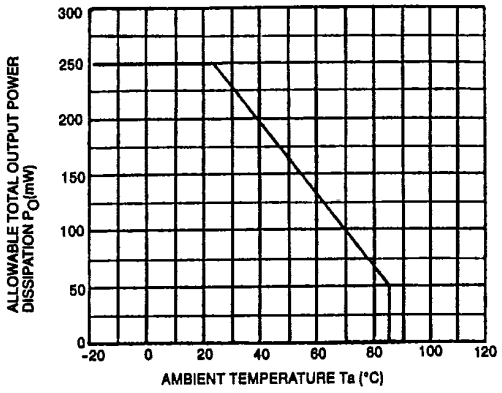
T-41-73

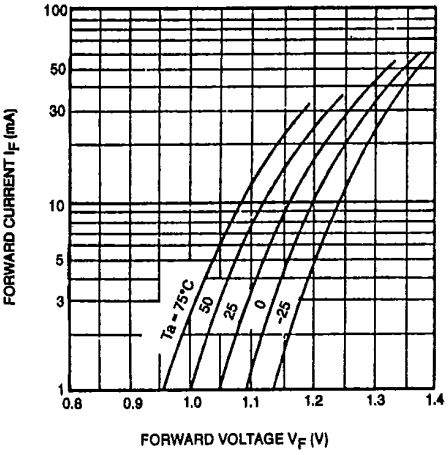
I_F — Ta



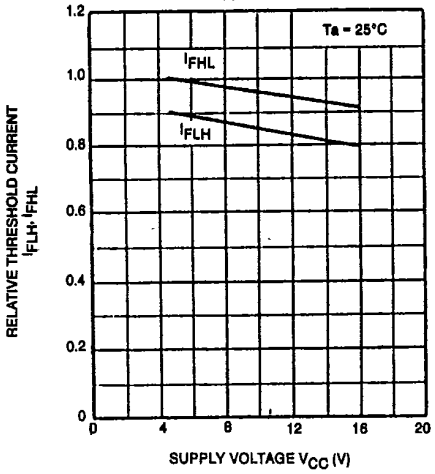
P_O — Ta



I_F — V_F (TYP.)



RELATIVE I_{FHL}, I_{FLH} — V_{CC} (TYP.)



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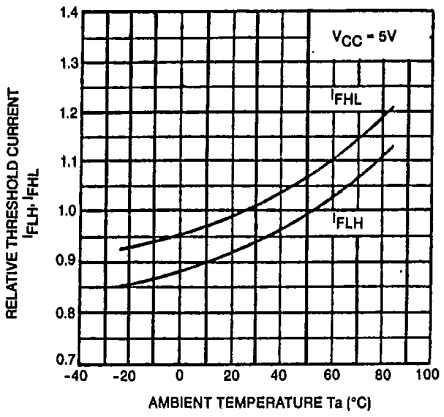
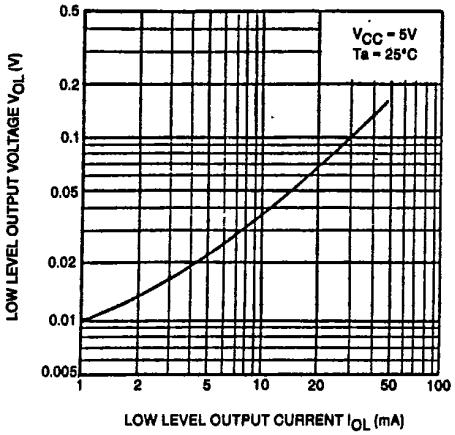
T-41-73

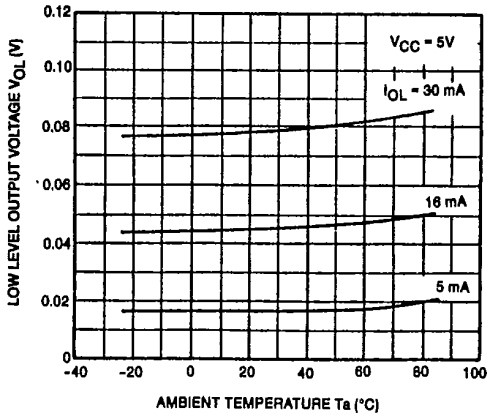
RELATIVE I_{FHL}, I_{FLH} — Ta (TYP.)



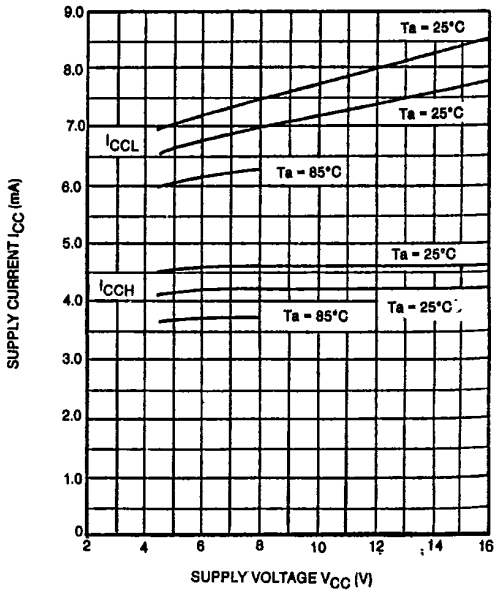
V_{OL} — I_{OL} (TYP.)



V_{OL} — Ta (TYP.)



I_{CC} — V_{CC} (TYP.)



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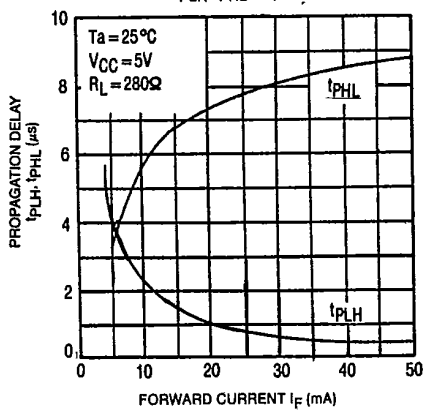
T-41-73

t_{PLH}, t_{PHL} — I_F (TYP.)



t_r, t_f — R_L (TYP.)