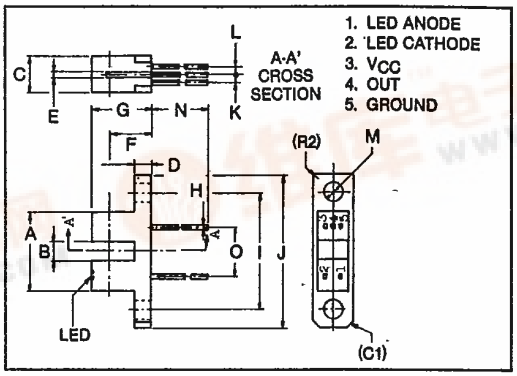
SLOTTED SWITCH

T-41-73

MTSS10000
INFRARED LED+ PHOTO IC

MTSS10000 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

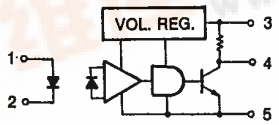
FEATURES

- TTL, LSTTL compatible.
- Wide supply voltage (V_{CC} = 4.5 ~ 16V)
- Non sensitivity for visible light.
- High speed (t_{on} 3μs, 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	0.197 ± 0.018	5 ± 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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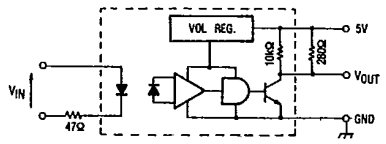
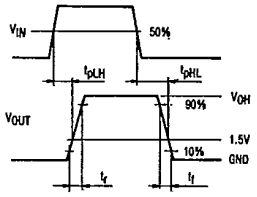
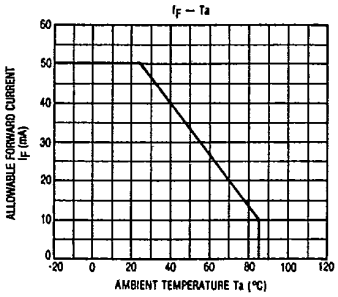
OPTO-ELECTRICAL CHARACTERISTICS (Ta=25°C)
(Over recommended temperature Ta=0~70°C unless otherwise noted.)

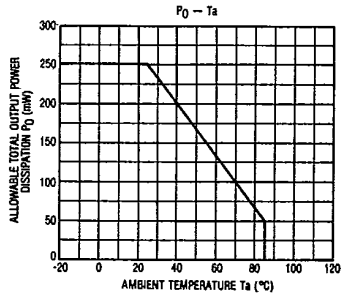
	CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
A	Forward Voltage		V_F	I_F=8mA	—	1.15	1.4	V
	Reverse Current		I_R	V_R=5V, Ta=25°C	—	—	10	μA
	Capacitance		C_T	V=0, f=1MHz, Ta=25°C	—	30	—	pF
B	Supply Voltage		V_{CC}	Ta=25°C	4.5	—	16	V
	Low Level Supply Current		I_{CCL}	V_{CC}=5V, I_F=0	—	6	15	mA
	High Level Supply Current		I_{CCH}	V_{CC}=5V, I_F=8mA	—	4	10	mA
	Low Level Output Voltage		V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=0	—	0.15	0.4	V
	High Level Output Voltage		V_{OH}	V_{CC}=5V, I_F=8mA	4.0	—	—	V
C	'H→L' LED Threshold Current		I_{FLH}	V_{CC}=5V, Ta=25°C	—	2	5	mA
				V_{CC}=5V	—	—	8	mA
	Hysteresis Ratio		I_{FHL}/I_{FLH}	V_{CC}=5V	—	0.9	—	—
	Propagation Delay (NOTE)	L→H	t_{PLH}	Ta=25°C	—	3	—	μS
		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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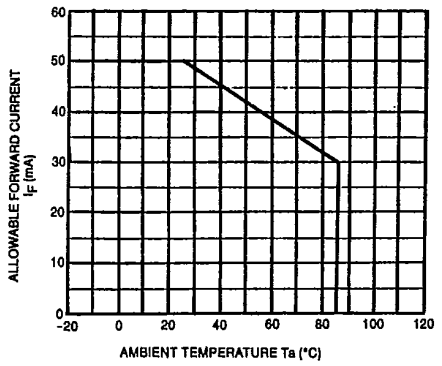
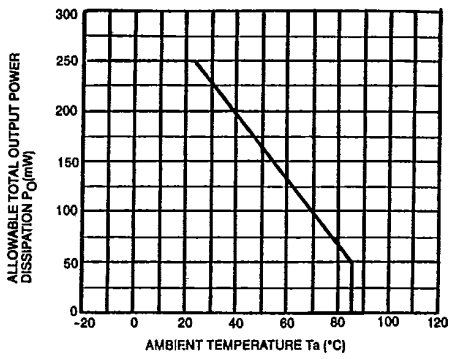
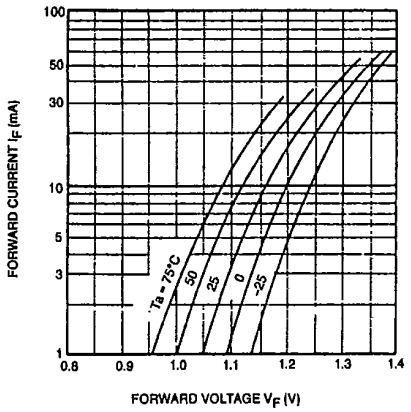
$I_F - Ta$



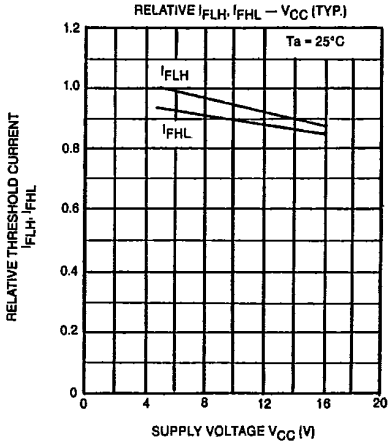
$P_O - Ta$



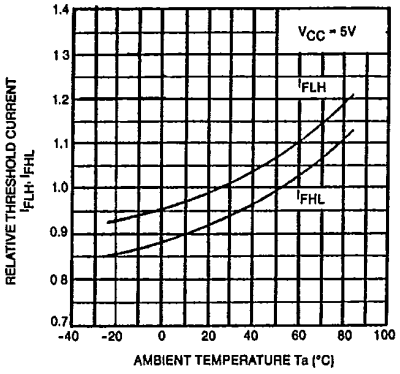
$I_F - V_F$ (TYP.)



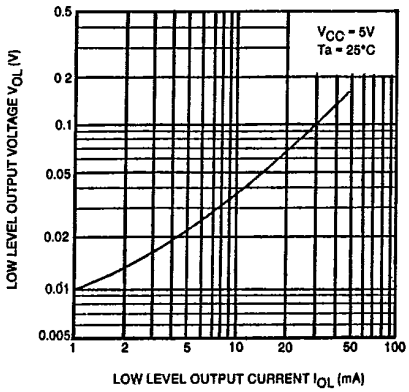
RELATIVE I_{FLH}, $I_{FHL} - V_{CC}$ (TYP.)



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



$V_{OL} - I_{OL}$ (TYP.)



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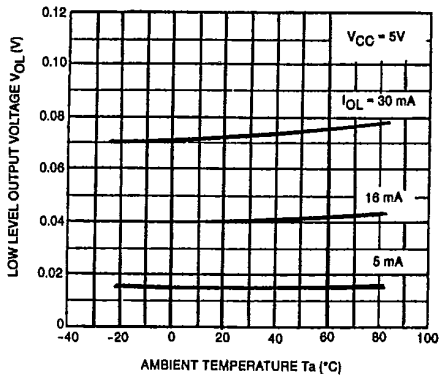
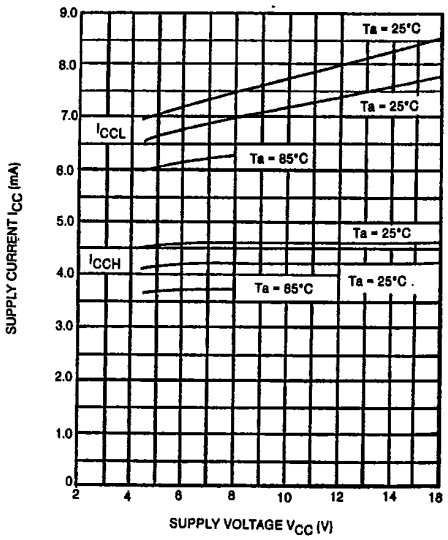
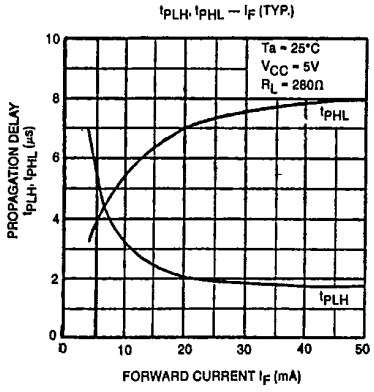
V_{OL} — Ta (TYP.)



I_{CC} — V_{CC} (TYP.)



t_{PLH}, t_{PHL} — I_F (TYP.)



t_r, t_f — R_L (TYP.)