

TOSHIBA PHOTOCOUPLER INFRARED LED + PHOTO IC

TLP550

DIGITAL LOGIC ISOLATION

LINE RECEIVER FEEDBACK CONTROL

POWER SUPPLY CONTROL

SWITCHING POWER SUPPLY

TRANSISTOR INVERTOR

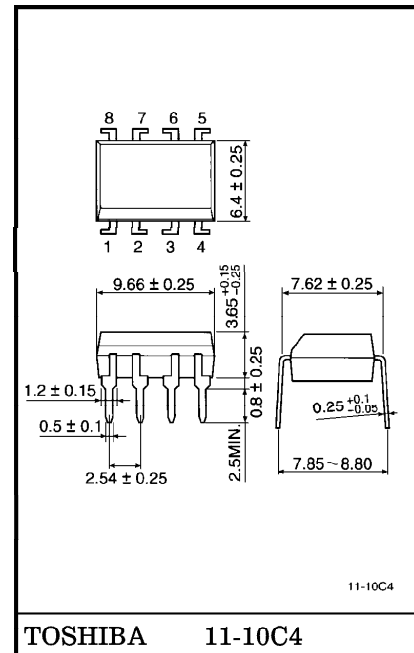
TLP550 constructs a high emitting diode and a one chip photo diode-transistor.

TLP550 has no base connection, and is suitable for application at noisy environmental condition.

This unit is 8-lead DIP package.

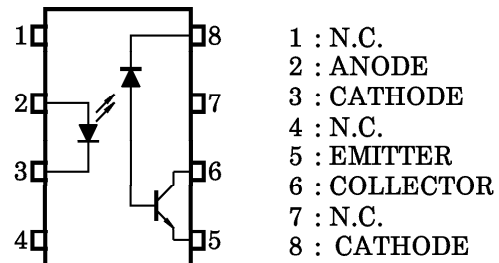
- Isolation Voltage : 2500Vrms (MIN.)
- Switching Speed : $t_{pHL}, t_{pLH} = 0.5\mu s$ (TYP.) ($R_L = 1.9k\Omega$)
- TTL Compatible
- UL Recognized : UL1577, File No. E67349

Unit in mm

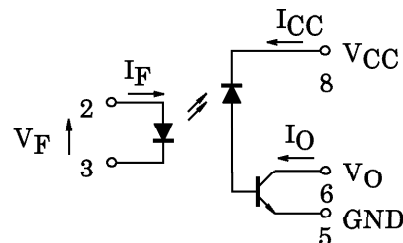


Weight : 0.54g

PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



961001EAA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current (Note 1)	I _F	25	mA
	Pulse Forward Current (Note 2)	I _{FP}	50	mA
	Peak Transient Forward Current (Note 3)	I _{FPT}	1	A
	Reverse Voltage	V _R	5	V
	Diode Power Dissipation (Note 4)	P _D	45	mW
DETECTOR	Output Current	I _O	8	mA
	Peak Output Current	I _{OP}	16	mA
	Supply Voltage	V _{CC}	−0.5~15	V
	Output Voltage	V _O	−0.5~15	V
	Output Power Dissipation (Note 5)	P _O	100	mW
Operating Temperature Range		T _{opr}	−55~100	°C
Storage Temperature Range		T _{stg}	−55~125	°C
Lead Solder Temperature (10s)		T _{sol}	260	°C
Isolation Voltage (AC, 1min., R.H=40~60%) (Note 6)		BV _S	2500	V _{rms}

(Note 1) Derate 0.8mA above 70°C.

(Note 2) 50% duty cycle, 1ms pulse width.
Derate 1.6mA/°C above 70°C.

(Note 3) Pulse width 1μs, 300pps.

(Note 4) Derate 0.9mW/°C above 70°C.

(Note 5) Derate 2mW/°C above 70°C.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

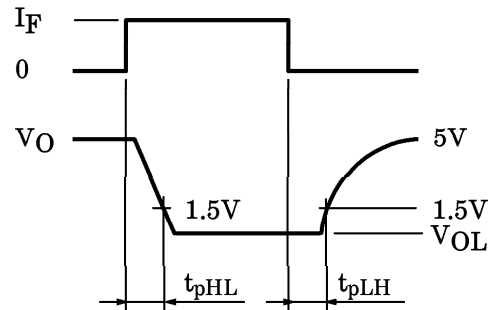
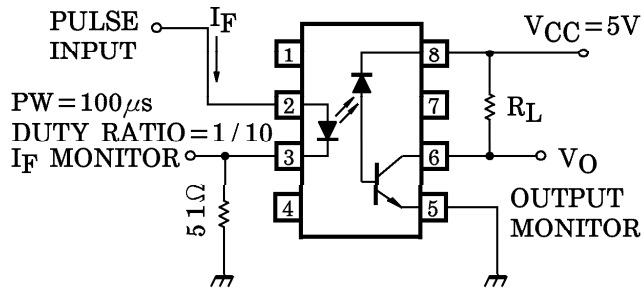
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 16\text{mA}$		1.45	1.65	1.85	V
	Forward Voltage Temperature Coefficient	$\Delta V_F / \Delta T_a$	$I_F = 16\text{mA}$		—	−2	—	mV/°C
	Reverse Current	I_R	$V_R = 5\text{V}$		—	—	10	μA
	Capacitance Between Terminal	C_T	$V_F = 0, f = 1\text{MHz}$		—	60	—	pF
DETECTOR	High Level Output Current	$I_{OH(1)}$	$I_F = 0\text{mA}, V_{CC} = V_O = 5.5\text{V}$		—	3	500	nA
		$I_{OH(2)}$	$I_F = 0\text{mA}, V_{CC} = V_O = 15\text{V}$		—	—	5	μA
		I_{OH}	$I_F = 0\text{mA}, V_{CC} = V_O = 15\text{V}$ $T_a = 70^\circ\text{C}$		—	—	50	μA
	High Level Supply Voltage	I_{CCH}	$I_F = 0\text{mA}, V_{CC} = 15\text{V}$		—	0.01	1	μA
COUPLED	Current Transfer Ratio	I_O / I_F	$I_F = 16\text{mA}$ $V_{CC} = 4.5\text{V}$ $V_O = 0.4\text{V}$	$T_a = 25^\circ\text{C}$	10	30	—	%
				Rank : 0	19	30	—	
				$T_a = 0 \sim 70^\circ\text{C}$	5	—	—	
				Rank : 0	15	—	—	
	Low Level Output Voltage	V_{OL}	$I_F = 16\text{mA}, V_{CC} = 4.5\text{V},$ $I_O = 1.1\text{mA}$ (Rank 0 : $I_O = 2.4\text{mA}$)		—	—	0.4	V
	Isolation Resistance	R_S	R.H. = 40~60%, V = 1kV DC (Note 6)		—	10^{12}	—	Ω
	Capacitance Between Input to Output	C_S	$V = 0, f = 1\text{MHz}$		—	0.8	—	pF

SWITCHING CHARACTERISTICS (Ta = 25°C)

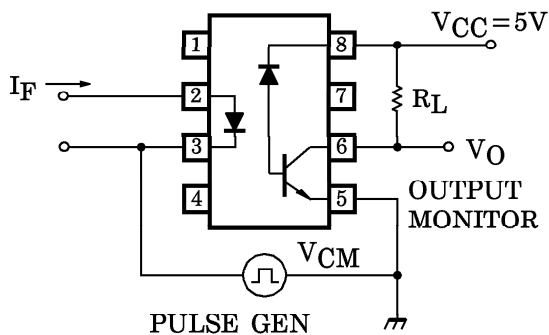
CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Propagation Delay Time (H→L)	t_{pHL}	$I_F = 0 \rightarrow 16\text{mA}, V_{CC} = 5\text{V}, R_L = 4.1\text{k}\Omega$		—	0.3	0.8	μs
		(Note 7)	Rank 0 : $R_L = 1.9\text{k}\Omega$	—	0.5	0.8	
Propagation Delay Time (L→H)	t_{pLH}	$I_F = 16 \rightarrow 0\text{mA}, V_{CC} = 5\text{V}, R_L = 4.1\text{k}\Omega$		—	1.0	2.0	μs
		(Note 7)	Rank 0 : $R_L = 1.9\text{k}\Omega$	—	0.6	1.2	
Common Mode Transient Immunity at High Output Level	C_{MH}	$I_F = 0\text{mA}, V_{CM} = 200\text{Vp-p}$ $R_L = 4.1\text{k}\Omega$ (Rank 0 : $R_L = 1.9\text{k}\Omega$) (Note 8)		—	1500	—	V / μs
Common Mode Transient Immunity at Low Output Level	C_{ML}	$I_F = 16\text{mA}, V_{CM} = 200\text{Vp-p}$ $R_L = 4.1\text{k}\Omega$ (Rank 0 : $R_L = 1.9\text{k}\Omega$) (Note 8)		—	−1500	—	V / μs

(Note 6) Device considered a two-terminal device : Pins 1, 2, 3 and 4 shorted together and Pin 5, 6, 7 and 8 shorted together.

(Note 7) Switching time test circuit.

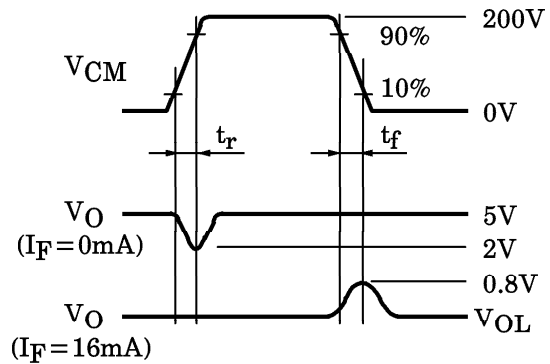


(Note 8) Common mode transient immunity test circuit.



$$Z_O = 50\Omega$$

$$CM_H = \frac{160(V)}{t_r(\mu s)}, CM_L = \frac{160(V)}{t_f(\mu s)}$$



(Note 9) Maximum electrostatic discharge voltage for any pins : 100V (C=200pF, R=0)

