

TLP750

- Digital Logic Ground Isolation
- Line Receiver
- Microprocessor System Interfaces
- Switching Power Supply Feedback Control
- Analog Signal Isolation
- Transistor Inverter

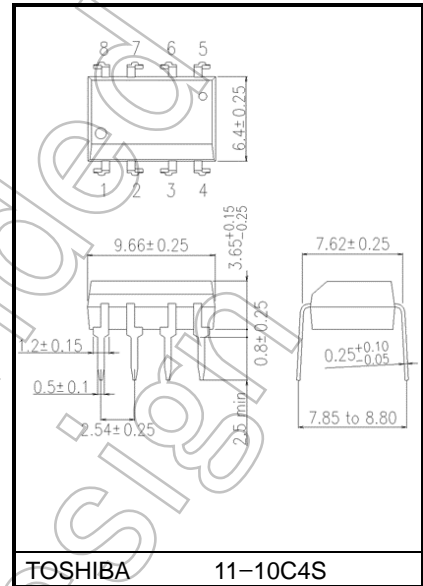
Unit: mm

The TOSHIBA TLP750 consists of a high-output infrared light emitting diode optically coupled to a high-speed photodiode with a transistor amplifier and is housed in an 8-pin DIP. The TLP750 has no internal base connection and features noise immunity, thus it is suitable for inverter drivers for variable-speed motor drives.

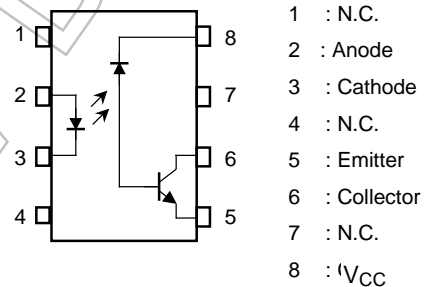
- Switching speed: $t_{pHL}=0.3\mu s$ (typ.)
- Switching speed: $t_{pLH}=0.5\mu s$ (typ.) ($R_L=1.9k\Omega$)
- Isolation voltage: 5000 V_{rms} (min)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1 : When a VDE approved type is needed, please designate the **Option(D4)**.

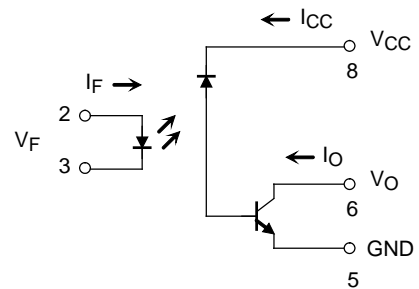
- Creepage distance: 6.4mm (min)
- Clearance: 6.4mm (min)
- Insulation thickness: 0.4mm (min)



Pin Configuration (top view)



Schematic



Start of commercial production
1989-10

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current (Note 1)	IF	25	mA
	Pulse forward current (Note 2)	IFP	50	mA
	Peak transient forward current (Note 3)	IFPT	1	A
	Reverse voltage	VR	5	V
	Diode power dissipation (Note 4)	PD	45	mW
Detector	Output current	IO	8	mA
	Peak output current	IOP	16	mA
	Output voltage	VO	-0.5 to 15	V
	Supply voltage	VCC	-0.5 to 15	V
	Output power dissipation (Note 5)	PO	100	mW
Operating temperature range		Topr	-55 to 100	°C
Storage temperature range		Tstg	-55 to 125	°C
Lead solder temperature(10 s) (Note 6)		Tsol	260	°C
Isolation voltage (AC, 60 s, R.H.= 60 %) (Note 7)		BVs	5000	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

(Note 1) Derate 0.8 mA / °C above 70 °C.

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

(Note 3) Pulse width ≤ 1 μs, 300 pps.

(Note 4) Derate 0.9 mW / °C above 70 °C.

(Note 5) Derate 2 mW / °C above 70 °C.

(Note 6) Soldering portion of lead: Up to 2mm from the body of the device.

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

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit							
LED	Forward voltage	V _F	I _F = 16 mA	—	1.65	1.85	V							
	Forward voltage temperature coefficient	ΔV _F / ΔTa	I _F = 16 mA	—	-2	—	mV / °C							
	Reverse current	I _R	V _R = 5 V	—	—	10	μA							
	Capacitance between terminal	C _T	V _F = 0 V, f = 1 MHz	—	45	—	pF							
Detector	High level output current	I _{OH(1)}	I _F = 0 mA, V _{CC} = V _O = 5.5 V	—	3	500	nA							
		I _{OH(2)}	I _F = 0 mA, V _{CC} = V _O = 15 V	—	—	5	μA							
		I _{OH}	I _F = 0 mA, V _{CC} = V _O = 15 V, Ta = 70 °C	—	—	50	μA							
	High level supply voltage	I _{CCH}	I _F = 0 mA, V _{CC} = 15 V	—	0.01	1	μA							
Coupled/ Insulation	Current transfer ratio	I _O /I _F	I _F = 16 mA V _{CC} = 4.5 V V _O = 0.4 V	Ta = 25° C	10	30	—	%						
				Rank: O	19	30	—							
				Ta = 0 to 70 °C	5	—	—							
	Low level output voltage	V _{OL}	I _F = 16 mA, V _{CC} = 4.5 V, I _O = 1.1 mA (rank O: I _O = 2.4 mA)	—	—	0.4	V							
								Isolation resistance	R _S	R.H. ≤ 60 %, V _S = 500 V _{DC} (Note 7)	1 × 10 ¹²	10 ¹⁴	—	Ω
											Capacitance between input to output	C _S	V _S = 0 V, f = 1 MHz (Note 7)	—
Isolation Voltage								BVS	AC, 60 s (Note 7)	5000				—

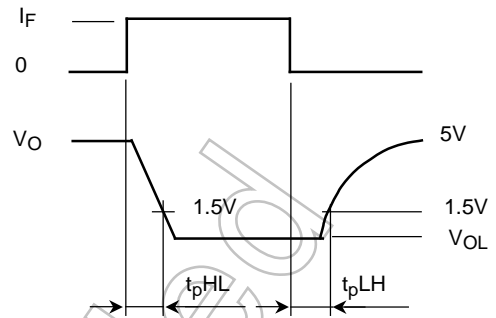
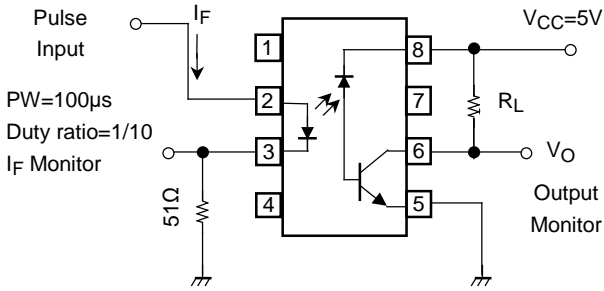
Switching Characteristics (Ta = 25°C, Vcc = 5V)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Propagation delay time (H→L)	t _{pHL}	1	I _F = 16 mA, R _L = 4.1 kΩ	—	0.2	0.8	μs
			Rank O: R _L = 1.9 kΩ	—	0.3	0.8	
Propagation delay time (L→H)	t _{pLH}	1	I _F = 16 mA, R _L = 4.1 kΩ	—	1	2	μs
			Rank O: R _L = 1.9 kΩ	—	0.5	1.2	
Common mode transient immunity at logic high output (Note 8)	CM _H	2	I _F = 0 mA, V _{CM} = 200 V _{p-p} R _L = 4.1 kΩ (Rank O: R _L = 1.9 kΩ)	—	1500	—	V / μs
Common mode transient immunity at logic low output (Note 8)	CM _L		I _F = 16 mA, V _{CM} = 200 V _{p-p} R _L = 4.1 kΩ (Rank O: R _L = 1.9 kΩ)	—	-1500	—	V / μs

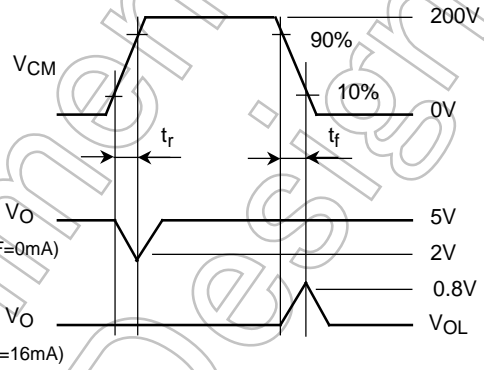
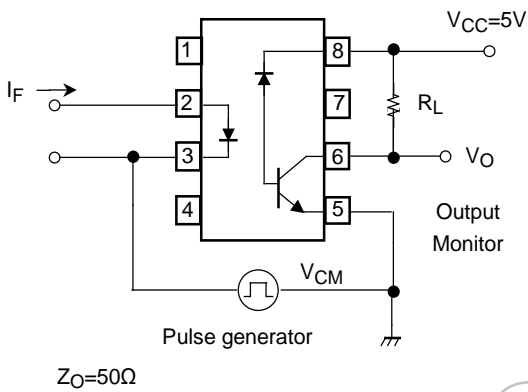
(Note 8) CML is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic low state (V_O < 0.8 V).

CMH is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic high state (V_O > 2.0 V).

Test Circuit 1: Switching Time Test Circuit



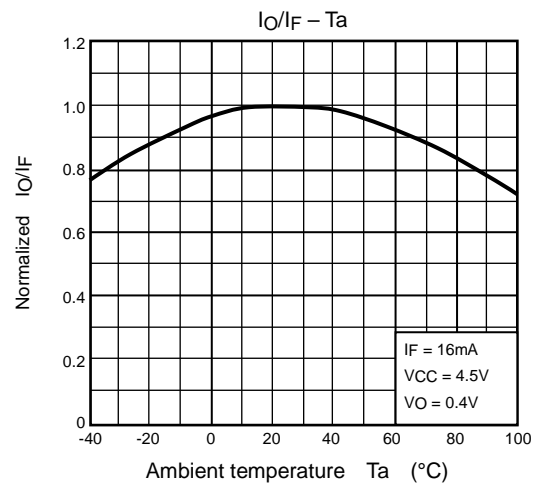
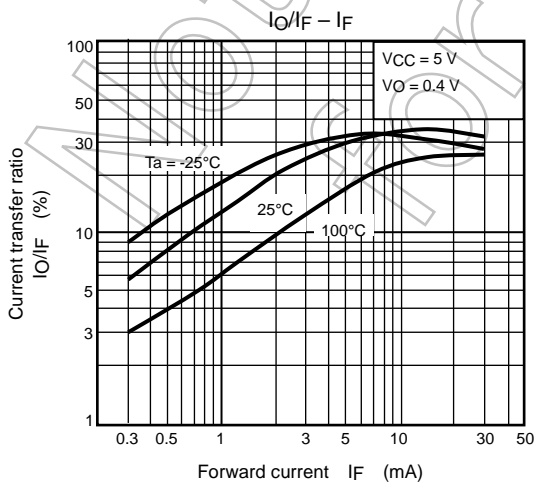
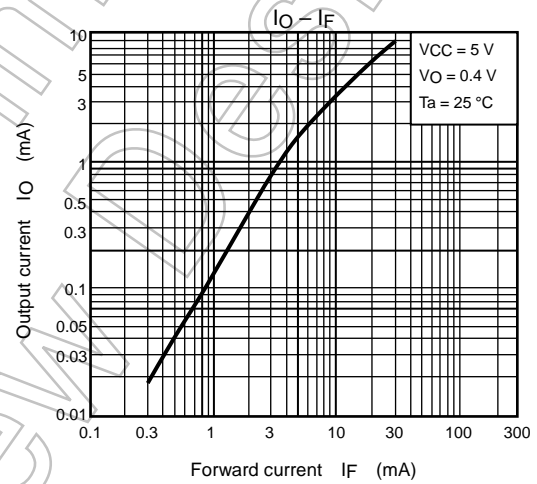
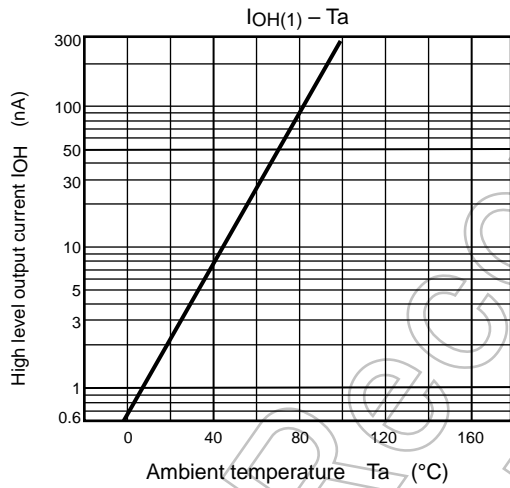
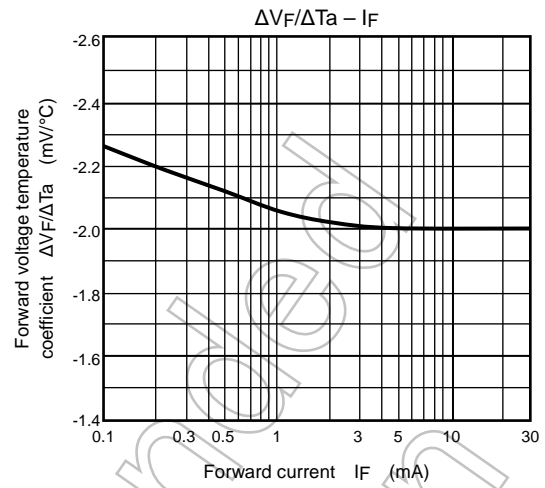
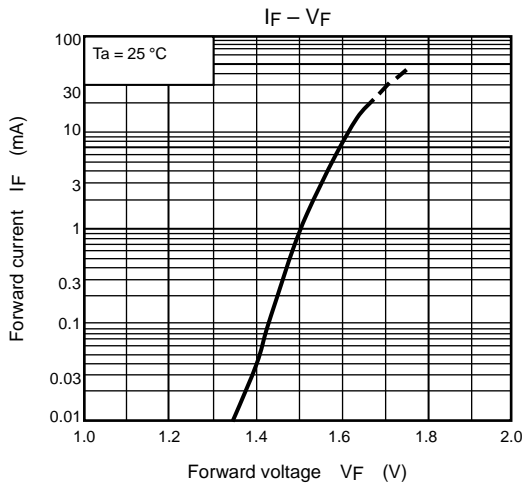
Test Circuit 2: Common Mode Noise Immunity Test Circuit



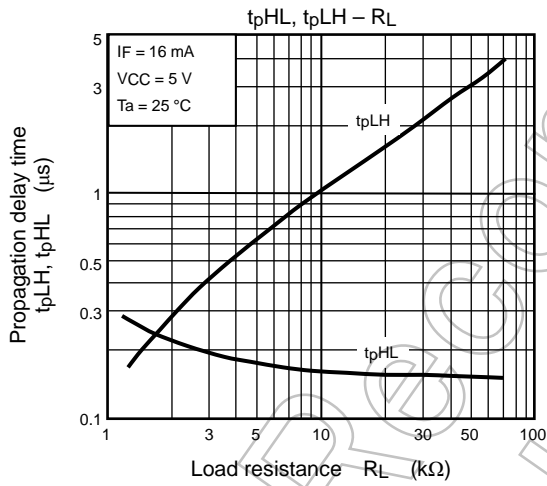
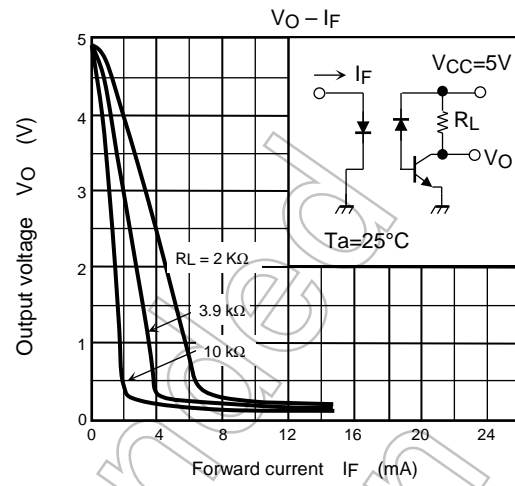
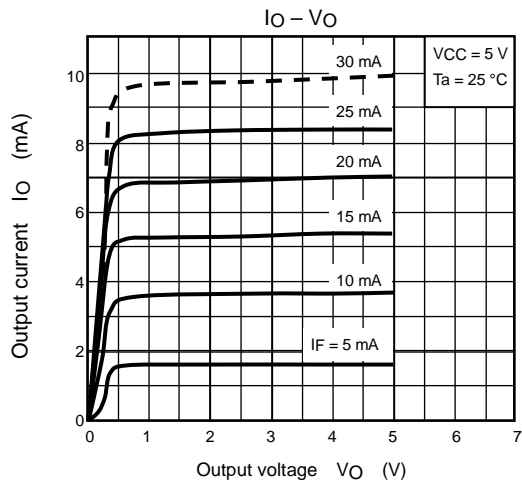
$Z_0=50\Omega$

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

Not Recommended for New



NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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