

TENTATIVE

TOSHIBA PHOTOCOUPLER GaAlAs IRED + PHOTO IC

TLP752

DEGITAL LOGIC GROUND ISOLATION

TRANSISTOR INVERTOR

MICROPROCESSOR SYSTEM ISOLATION INTERFACES

SWITCHING POWER SUPPLY FEEDBACK CONTROL

ANALOG SIGNAL ISOLATION

The TOSHIBA TLP752 consists of GaAlAs high-output light emitting diode and a high speed detector of one chip photo diode-transistor. This unit is 8-lead DIP.

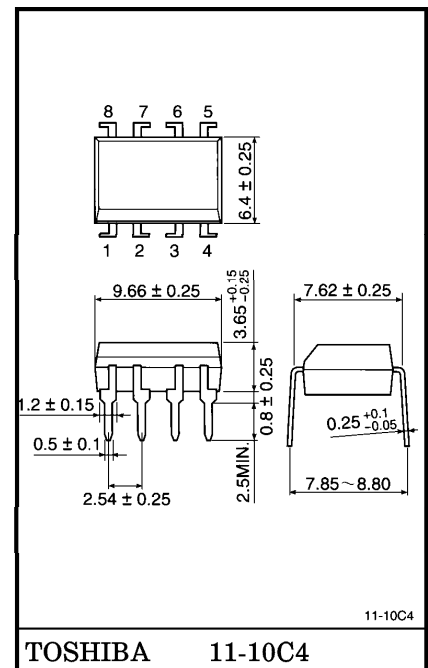
TLP752 has no internal base connection, and is suitable for application in noisy environmental conditions.

- Isolation Voltage : 5000V_{rms} (Min.)
- Switching Speed : $t_{pHL}=0.3\mu s$ (Typ.)
- Switching Speed : $t_{pLH}=0.5\mu s$ (Typ.) ($R_L=4.1k\Omega$)
- TTL Compatible
- Safety Standards : Pending

UL	UL1577
VDE	VDE0884
BSI	BS EN60950
SEMKO	SS-EN60950
- Structural Parameter

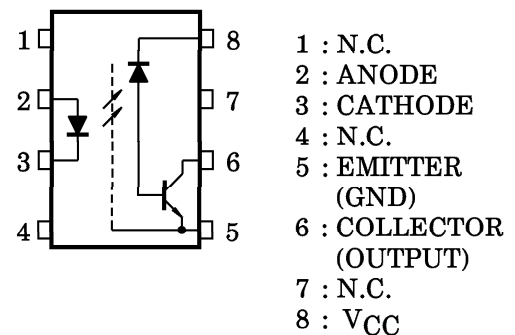
Creepage Distance	: 7.0mm (Min.)
Clearance	: 7.0mm (Min.)
Insulation Thickness	: 0.4mm (Min.)
Internal Creepage Pass	: 4.0mm (Min.)

Unit in mm

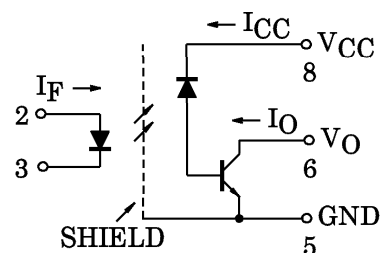


Weight : 0.54g

PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current (Note 1)	I _F	20	mA
	Pulse Forward Current (Note 2)	I _{FP}	40	mA
	Peak Transient Forward Current (Note 3)	I _{FPT}	1	A
	Reverse Voltage	V _R	5	V
DETECTOR	Output Current	I _O	8	mA
	Peak Output Current	I _{OP}	16	mA
	Output Voltage	V _O	−0.5~20	V
	Supply Voltage	V _{CC}	−0.5~30	V
	Output Power Dissipation (Note 4)	P _O	100	mW
Operating Temperature Range		T _{opr}	−55~100	°C
Storage Temperature Range		T _{stg}	−55~125	°C
Lead Solder Temperature (10s) (Note 5)		T _{sol}	260	°C
Isolation Voltage (AC, 1min., R.H=60%) (Note 6)		BVS	5000	V _{rms}

Note 1 : Derate 0.36mA/°C above 70°C.

Note 2 : 50% duty cycle, 1ms pulse width.
Derate 0.72mA/°C above 70°C.

Note 3 : Pulse width ≤ 1μs, 300pps.

Note 4 : Derate 2mW/°C above 70°C.

Note 5 : Soldering portion of lead : up to 2mm from the body of the device.

Note 6 : 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	$I_F = 16\text{mA}$	—	1.42	1.72	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	$V_F = 0, f = 1\text{MHz}$	—	30	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_O / I_F	$I_F = 16\text{mA}, V_{CC} = 4.5\text{V}$ $V_O = 0.4\text{V}$	10	30	—	%
		$I_F = 16\text{mA}, V_{CC} = 4.5\text{V}$ $V_O = 0.4\text{V}, T_a = 0 \sim 70^\circ\text{C}$	5	—	—	
Low Level Output Voltage	V_{OL}	$I_F = 16\text{mA}, V_{CC} = 4.5\text{V}$ $I_O = 1.1\text{mA}$	—	—	0.4	V

ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Isolation Resistance	C_S	$V_S = 0, f = 1\text{MHz}$ (Note 6)	—	0.8	—	pF
Capacitance Between Input to Output	R_S	$R.H. \leq 60\%, V_S = 500\text{V}$ (Note 6)	5×10^{12}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	—	—	V_{rms}
		AC, 1 second, in oil	—	10000	—	
		AC, 1 minute, in oil	—	10000	—	Vdc

SWITCHING CHARACTERISTICS (Ta = 25°C, V_{CC} = 5V)

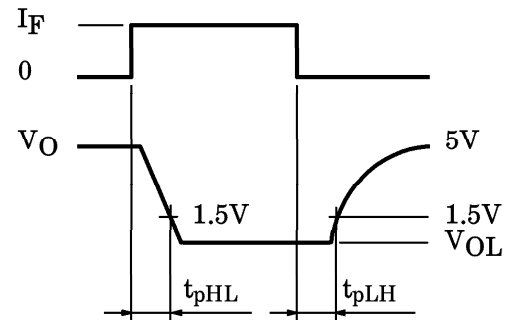
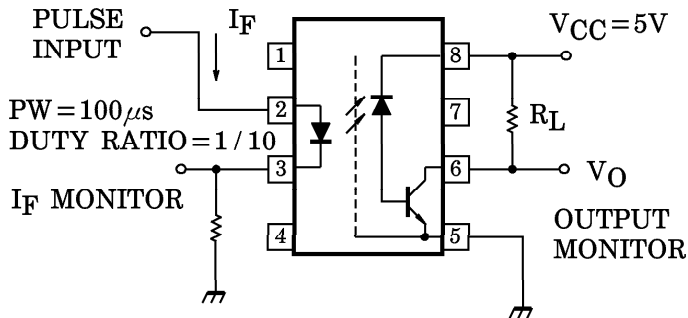
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time (H→L)	t_{pHL}	1	$I_F = 16\text{mA}, R_L = 4.1\text{k}\Omega$	—	0.3	—	μs
Propagation Delay Time (L→H)	t_{pLH}		$I_F = 0\text{mA}, R_L = 4.1\text{k}\Omega$	—	0.5	—	μs
Common Mode Transient Immunity at Logic High Output (Note 7)	C_{MH}	2	$I_F = 0\text{mA}, V_{CM} = 400\text{Vp-p}$ $R_L = 4.1\text{k}\Omega$	—	10000	—	V / μs
Common Mode Transient Immunity at Logic Low Output (Note 7)	C_{ML}		$I_F = 16\text{mA}, V_{CM} = 400\text{Vp-p}$ $R_L = 4.1\text{k}\Omega$	—	-10000	—	V / μs

Note 7 : C_{ML} is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic low state ($V_O < 0.8V$).

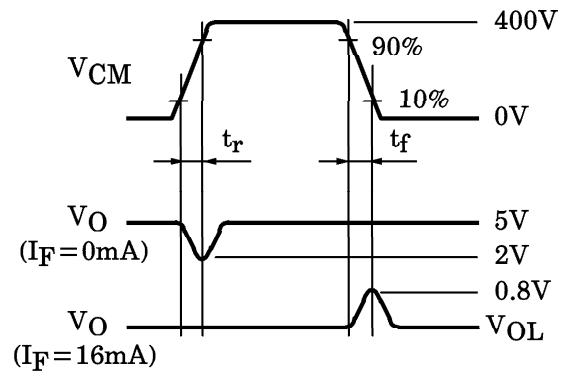
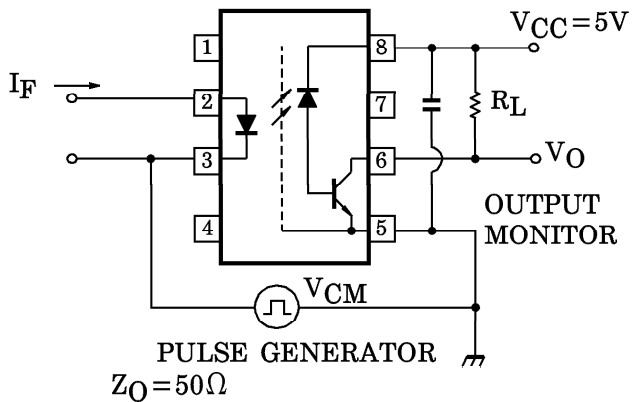
C_{MH} is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic high state ($V_O > 2.0V$).

Note 8 : Maximum electrostatic discharge voltage for any pins : 100V ($C=200pF$, $R=0$).

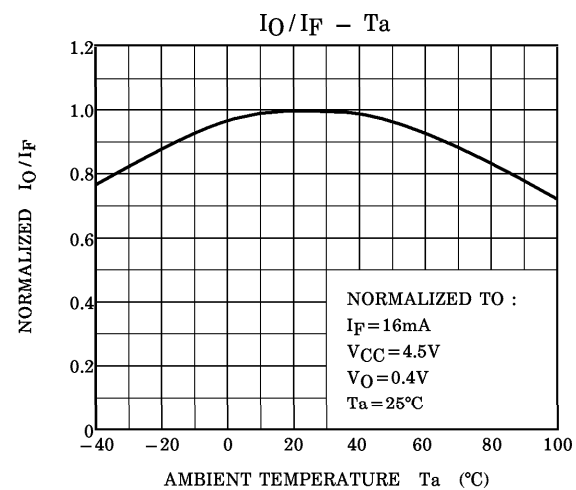
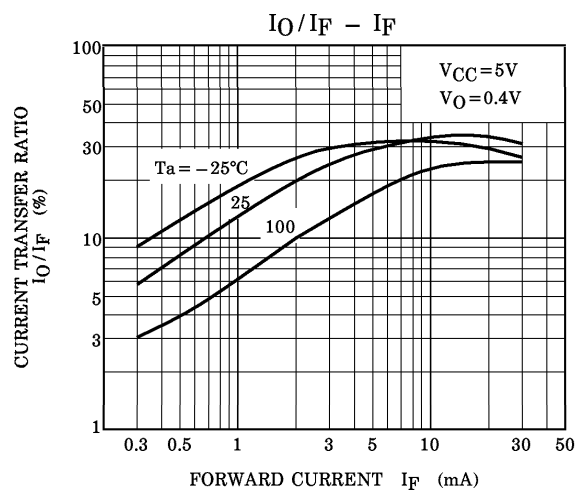
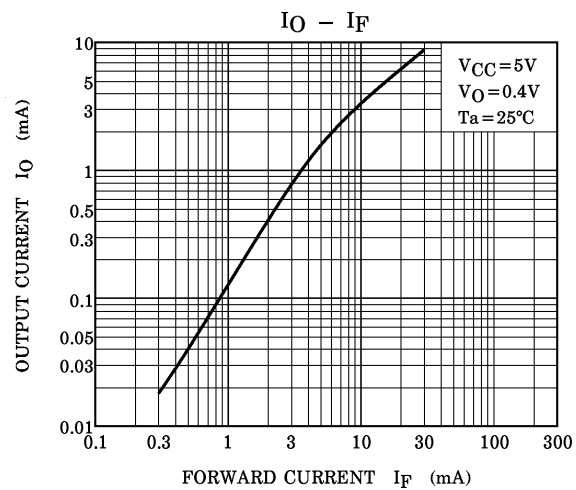
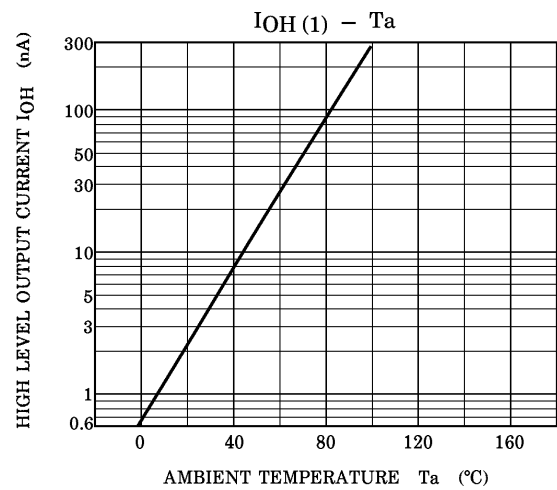
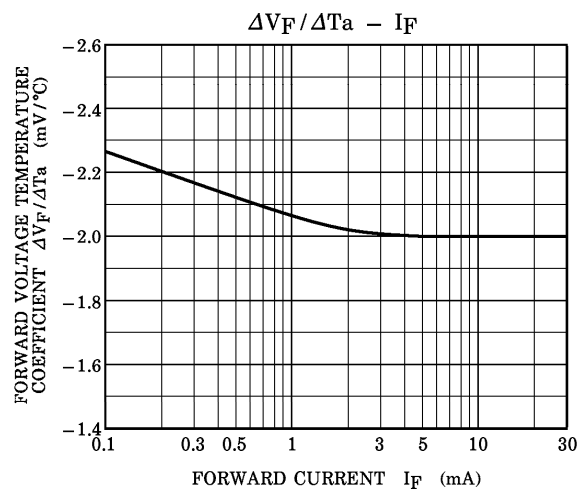
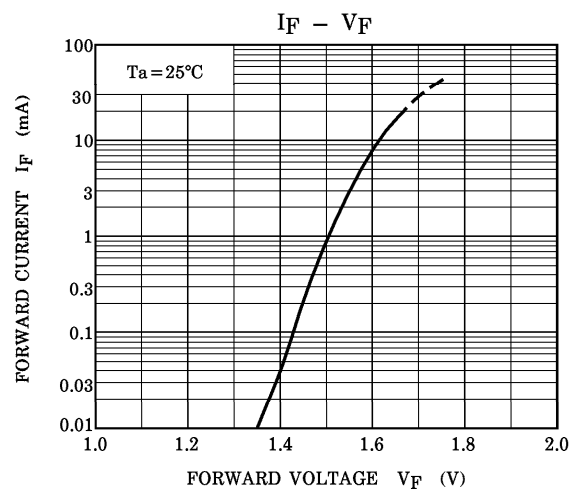
TEST CIRCUIT 1 : Switching Time Test Circuit

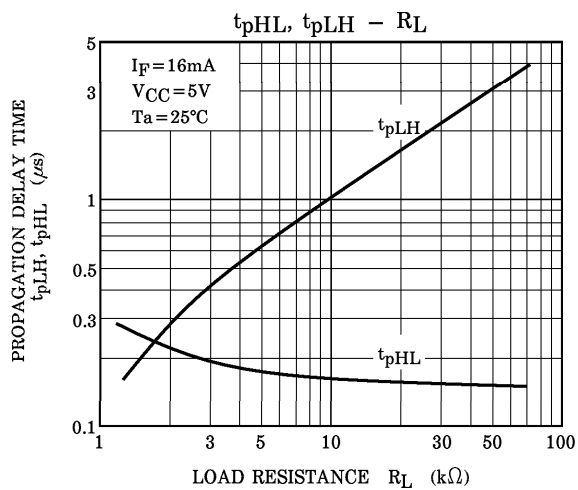
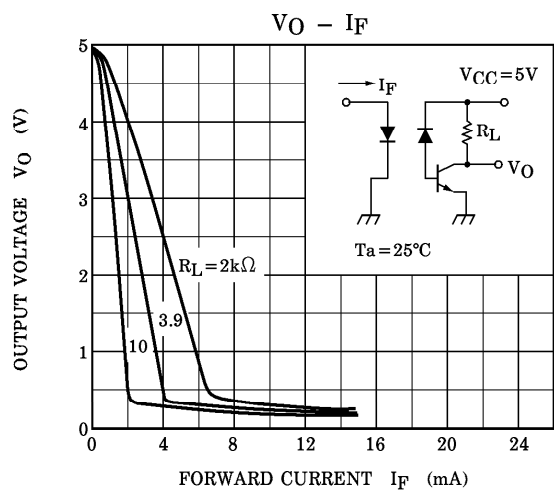
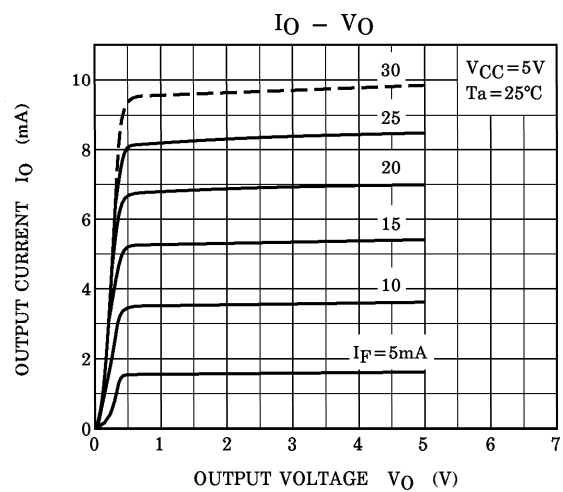


TEST CIRCUIT 2 : Common Mode Noise Immunity Test Circuit



$$CM_H = \frac{320(V)}{t_r(\mu s)}, CM_L = \frac{320(V)}{t_f(\mu s)}$$





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