

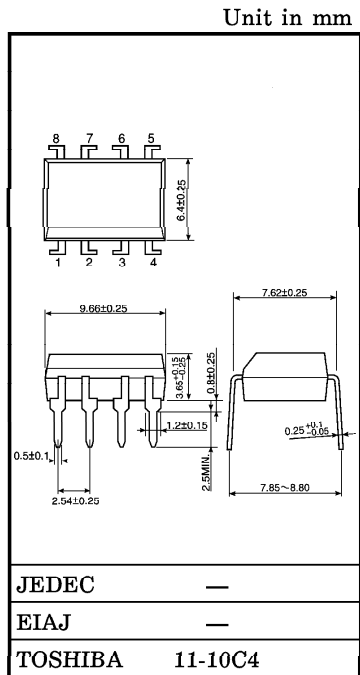
(TLP2630)

- DEGITAL LOGIC ISOLATION
- TELE-COMMUNICATION
- ANALOG DATA EQUIPMENT CONTROL
- MICROPROCESSOR SYSTEM INTERFACE

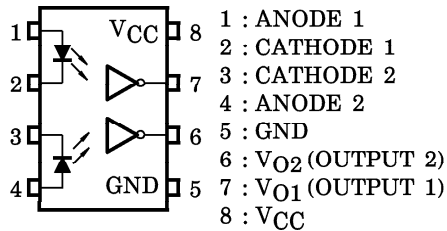
The TOSHIBA TLP2630 dual photocoupler consists of a pair of GaAlAs light emitting diode and integrated high gain, high speed photodetector.

The output of the detector circuit is an open collector, Schottky clamped transistor. This unit is 8-lead DIP package.

- Input Current Threshold : $I_F = 5\text{mA (MAX.)}$
- LSTTL/TTL Compatible : 5V Supply
- Switching Speed : 10MBd (TYP.)
- Guaranteed Performance Over Temperature : 0~70°C
- Isolation Voltage : 2500V_{rms} (MIN.)
- UL Recognized : UL1577, File No. E67349



PIN CONFIGURATION (TOP VIEW)

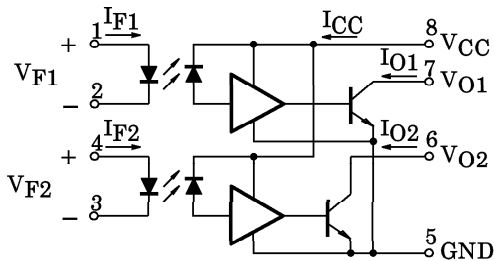


TRUTH TABLE
 (Positive Logic)

INPUT	OUTPUT
H	L
L	H

A 0.01 to 0.1μF bypass capacitor must be connected between pins 8 and 5 (See Note 1).

SCHEMATIC



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RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Input Current, Low Level, Each Channel	I _{FL}	0	—	250	μA
Input Current, High Level, Each Channel	I _{FH}	6.3*	—	15	mA
Supply Voltage, Output	V _{CC}	4.5	5	5.5	V
Fan Out (TTL Load, Each Channel)	N	—	—	8	
Operating Temperature	T _{opr}	0	—	70	°C

* 6.3mA is a guard banded value which allows for at least 20% CTR degradation.
Initial input current threshold value is 5.0mA or less.

MAXIMUM RATINGS (No derating required up to 70°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current (Each Channel)	I _F	15	mA
	Pulse Forward Current (Each Channel)*	I _{FP}	30	mA
	Reverse Voltage (Each Channel)	V _R	5	V
DETECTOR	Output Current (Each Channel)	I _O	16	mA
	Output Voltage (Each Channel)	V _O	-0.5~7	V
	Supply Voltage (1 Minute Maximum)	V _{CC}	7	V
	Output Collector Power Dissipation (Each Channel)	P _O	40	mW
Operating Temperature Range		T _{stg}	-55~125	°C
Storage Temperature Range		T _{opr}	-40~85	°C
Lead Soldering Temperature (10s) (Note 1)		T _{sol}	260	°C
Isolation Voltage (AC, 1min., R.H. ≤ 60%, Note 3)		BV _S	2500	V _{rms}

* t ≤ 1 msec Duration.

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ELECTRICAL CHARACTERISTICS (Ta = 0~70°C, Unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.*	MAX.	UNIT
Input Forward Voltage (Each Channel)	V _F	I _F = 10mA, Ta = 25°C	—	1.65	1.75	V
Input Diode Temperature Coefficient (Each Channel)	ΔV _F / ΔTa	I _F = 10mA	—	-2.0	—	mV / °C
Input Reverse Breakdown Voltage (Each Channel)	BV _R	I _R = 10μA, Ta = 25°C	5	—	—	V
Input Capacitance (Each Channel)	C _T	V _F = 0, f = 1MHz	—	45	—	pF
High Level Output Current (Each Channel)	I _{OH}	V _{CC} = 5.5V, V _O = 5.5V I _F = 250μA	—	1	250	μA
Low Level Output Voltage (Each Channel)	V _{OL}	V _{CC} = 5.5V, I _F = 5mA I _{OL} (Sinking) = 13mA	—	0.4	0.6	V
High Level Supply Current (Both Channels)	I _{CCH}	V _{CC} = 5.5V, I _F = 0	—	14	30	mA
Low Level Supply Current (Both Channels)	I _{CCL}	V _{CC} = 5.5V, I _F = 10mA	—	24	36	mA
Isolation Voltage	R _S	V _S = 500V, R.H. ≤ 60% (Note 3)	—	10 ¹⁴	—	Ω
Capacitance (Input-Output)	C _S	f = 1MHz (Note 3)	—	0.6	—	pF
Input-Input Leakage Current	I _{I-I}	R.H. ≤ 60%, t = 5s V _{I-I} = 500V (Note 6)	—	0.005	—	μA
Resistance (Input-Input)	R _{I-I}	V _{I-I} = 500V (Note 6)	—	10 ¹¹	—	Ω
Capacitance (Input-Input)	C _{I-I}	f = 1MHz (Note 6)	—	0.25	—	pF

* All typical values are at V_{CC} = 5V, Ta = 25°C.

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

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time to Low Output Level	t _{pHL}	1	I _F = 0 → 7.5mA, R _L = 350Ω C _L = 15pF (Each Channel)	—	60	75	ns
Propagation Delay Time to High Output Level	t _{pLH}	1	I _F = 7.5mA → 0, R _L = 350Ω C _L = 15pF (Each Channel)	—	60	75	ns
Output Rise a Time, Output Fall Time (10~90%)	t _r , t _f	1	I _F = 0 ⇄ 7.5mA, R _L = 350Ω C _L = 15pF (Each Channel)	—	30	—	ns
Common Mode Transient Immunity at High Output Level	CM _H	2	I _F = 0, R _L = 350Ω V _{CM} = 200V, V _O (MIN.) = 2V (Each Channel, Note 4)	—	200	—	V / μs
Common Mode Transient Immunity at Low Output Level	CM _L	2	I _F = 7.5mA, R _L = 350Ω V _{CM} = 200V V _O (MAX.) = 0.8V (Each Channel, Note 5)	—	-500	—	V / μs

Note 1 : 1.6mm below seating plane.

Note 2 : The V_{CC} supply voltage to each TLP2630 isolator must be bypassed by a 0.01μF capacitor or larger. This can be either a ceramic or solid tantalum capacitor with good high frequency characteristic and should be connected as close as possible to the package V_{CC} and GND pins each device.

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

Note 4 : CM_H · The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the high state (i.e., V_{OUT} > 2.0V)

Note 5 : CM_L · The maximum tolerable rate of fall of the common mode voltage to ensure the output will remain in the low output state (i.e., V_{OUT} > 0.8V)
Measured in volts per microsecond (V / μs).

Note 6 : Measured between pins 1 and 2 shorted together, and pins 3 and 4 shorted together.

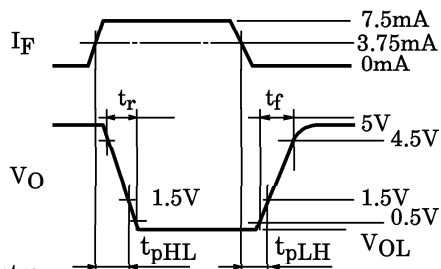
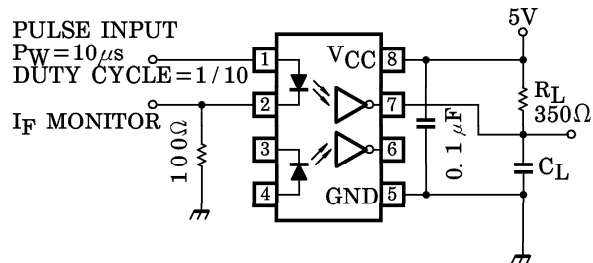
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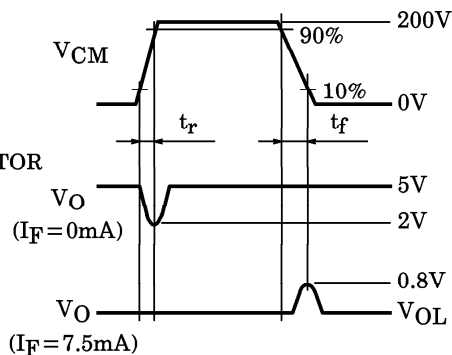
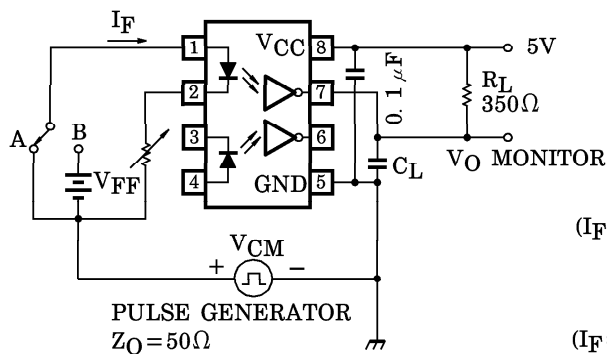
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TEST CIRCUIT 1. t_{pHL} and t_{pLH}



* C_L is approximately 15pF which includes probe and stray wiring capacitance.

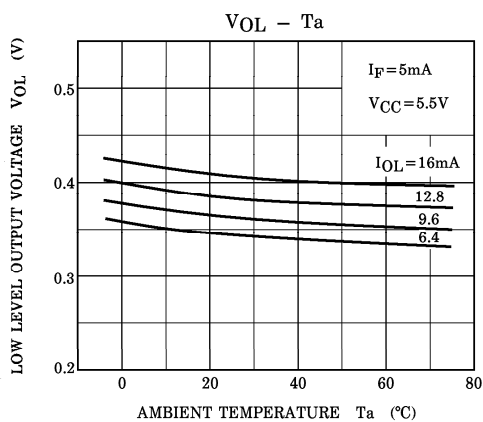
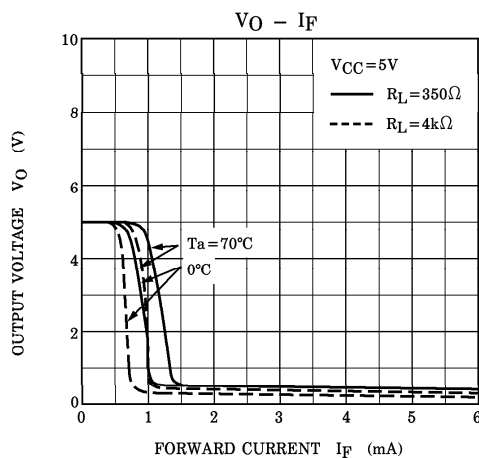
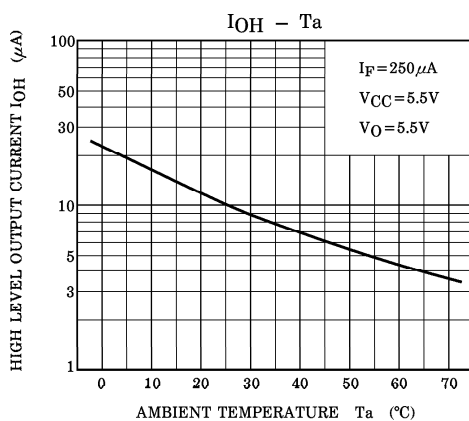
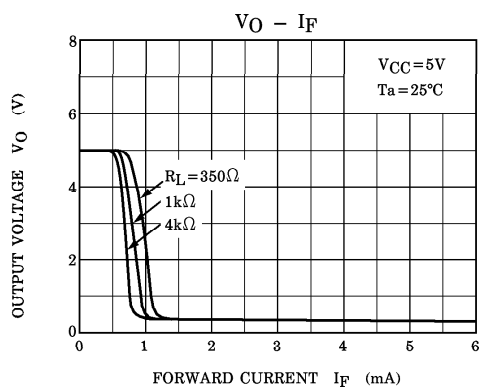
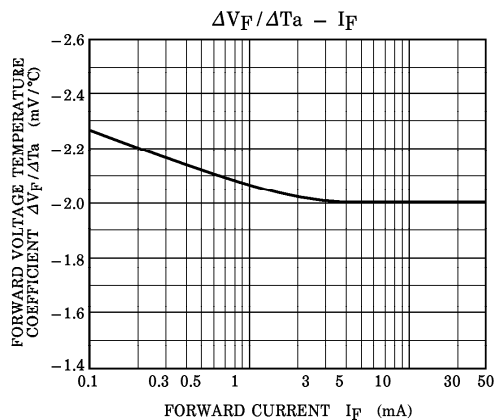
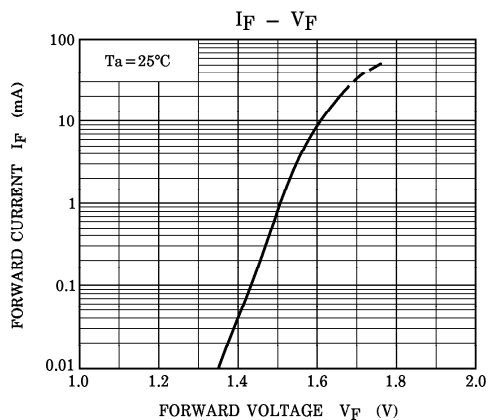
TEST CIRCUIT 2. Transient Immunity and Typical Waveforms.



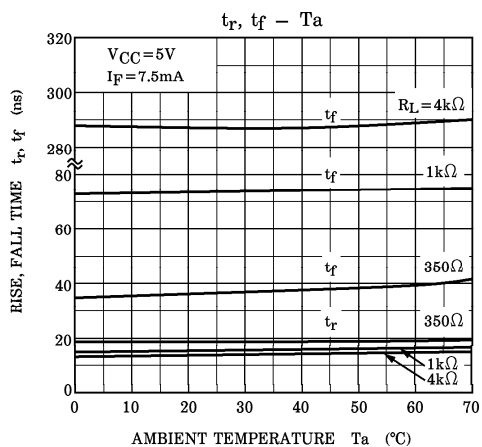
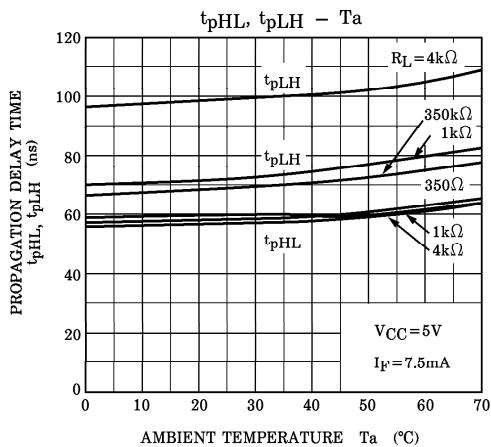
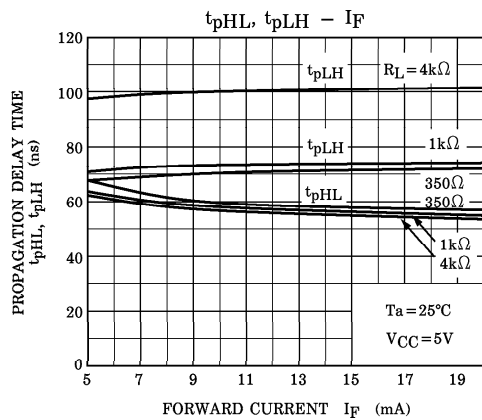
$$CM_H = \frac{160 (V)}{t_r (\mu s)}, \quad CM_L = \frac{160 (V)}{t_f (\mu s)}$$

* C_L is approximately 15pF which includes probe and stray wiring capacitance.

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