

(TLP2630)

DEGITAL LOGIC ISOLATION

TELE-COMMUNICATION

ANALOG DATA EQUIPMENT CONTROL

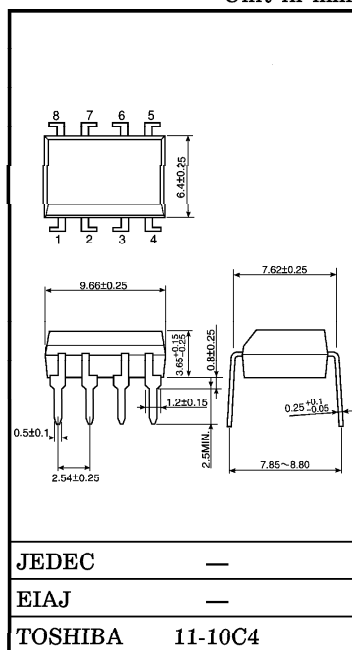
MICROPROCESSOR SYSTEM INTERFACE

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

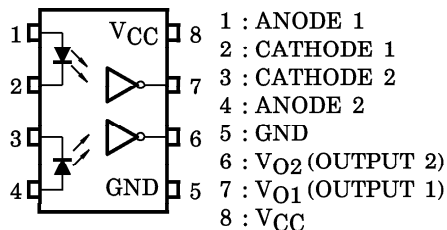
The output of the detector circuit is an open collector, Schottky clamped transistor. This unit is 8-lead DIP package.

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

Unit in mm



PIN CONFIGURATION (TOP VIEW)

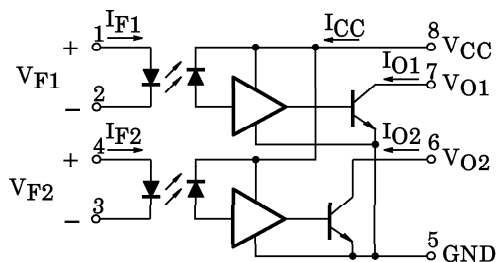


TRUTH TABLE (Positive Logic)

INPUT	OUTPUT
H	L
L	H

A 0.01 to $0.1\mu\text{F}$ bypass capacitor must be connected between pins 8 and 5 (See Note 1).

SCHEMATIC



© 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.

© These TOSHIBA products are intended for use in general commercial applications (office equipment, communication equipment, measuring equipment, domestic appliances, etc.), please make sure that you consult with us before you use these TOSHIBA products in equipment which requires extraordinarily high quality and/or reliability, and in equipment which may involve life threatening or critical application, including but not limited to such uses as atomic energy control, airplane or spaceship instrumentation, traffic signals, medical instrumentation, combustion control, all types of safety devices, etc. TOSHIBA cannot accept and hereby disclaims liability for any damage which may occur in case the TOSHIBA products are used in such equipment or applications without prior consultation with TOSHIBA.

(TLP2630)

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.

TLP2630 – 2

1996 – 4 – 8

TOSHIBA CORPORATION

(TLP2630)

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.

TLP2630 – 3

1996 – 4 – 8

TOSHIBA CORPORATION

(TLP2630)

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time to Low Output Level	t_{pHL}	1	$I_F = 0 \rightarrow 7.5\text{mA}$, $R_L = 350\Omega$ $C_L = 15\text{pF}$ (Each Channel)	—	60	75	ns
Propagation Delay Time to High Output Level	t_{pLH}	1	$I_F = 7.5\text{mA} \rightarrow 0$, $R_L = 350\Omega$ $C_L = 15\text{pF}$ (Each Channel)	—	60	75	ns
Output Rise a Time, Output Fall Time (10~90%)	t_r , t_f	1	$I_F = 0 \rightleftharpoons 7.5\text{mA}$, $R_L = 350\Omega$ $C_L = 15\text{pF}$ (Each Channel)	—	30	—	ns
Common Mode Transient Immunity at High Output Level	CM_H	2	$I_F = 0$, $R_L = 350\Omega$ $V_{CM} = 200\text{V}$, V_O (MIN.) = 2V (Each Channel, Note 4)	—	200	—	$\text{V} / \mu\text{s}$
Common Mode Transient Immunity at Low Output Level	CM_L	2	$I_F = 7.5\text{mA}$, $R_L = 350\Omega$ $V_{CM} = 200\text{V}$ V_O (MAX.) = 0.8V (Each Channel, Note 5)	—	-500	—	$\text{V} / \mu\text{s}$

Note 1 : 1.6mm below seating plane.

Note 2 : The V_{CC} supply voltage to each TLP2630 isolator must be bypassed by a $0.01\mu\text{F}$ 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., $V_{OUT} > 2.0\text{V}$)

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., $V_{OUT} > 0.8\text{V}$)
 Measured in volts per microsecond ($\text{V} / \mu\text{s}$).

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

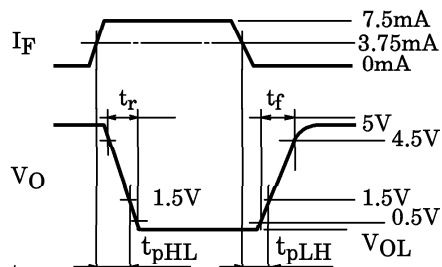
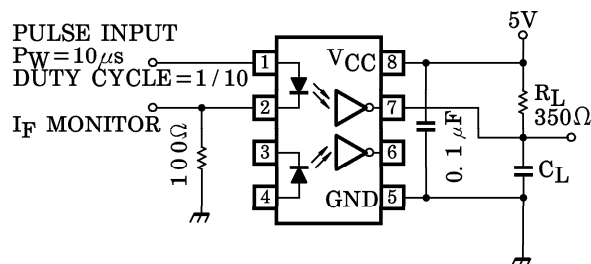
TLP2630 - 4

1996 - 4 - 8

TOSHIBA CORPORATION

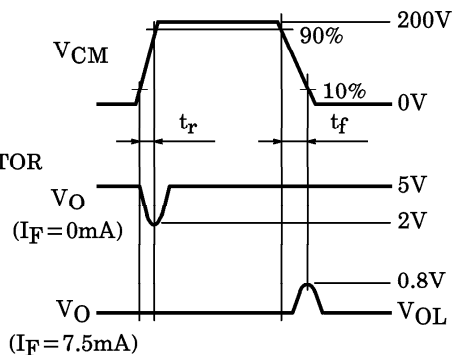
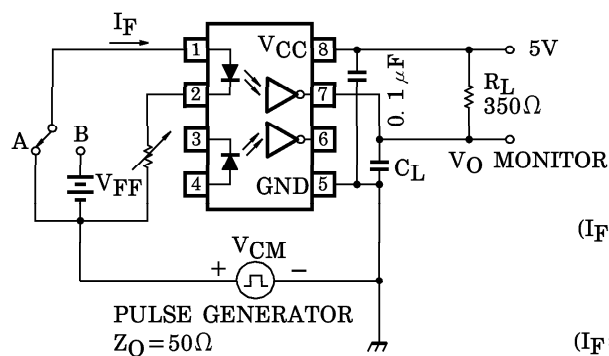
(TLP2630)

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



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

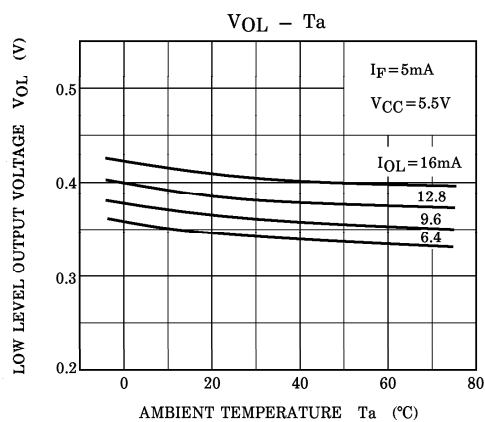
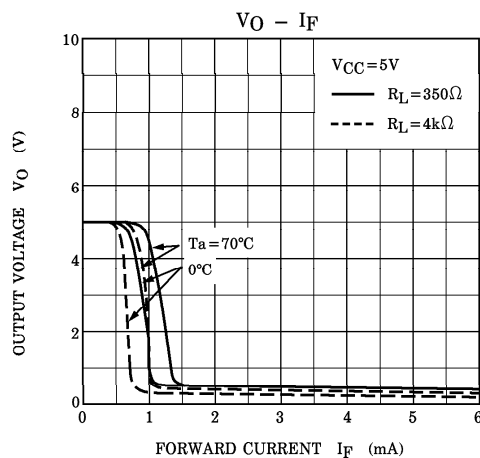
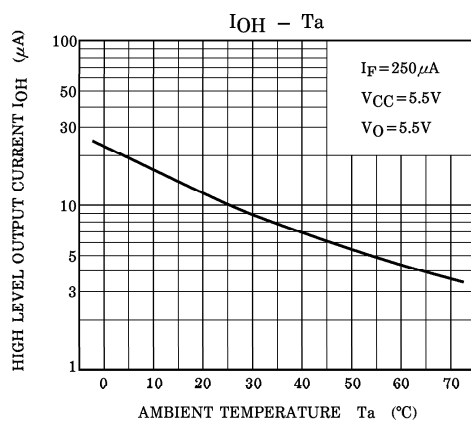
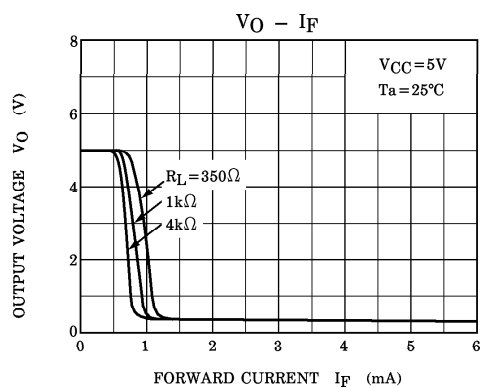
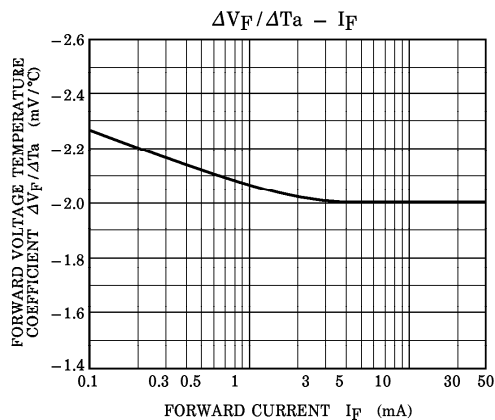
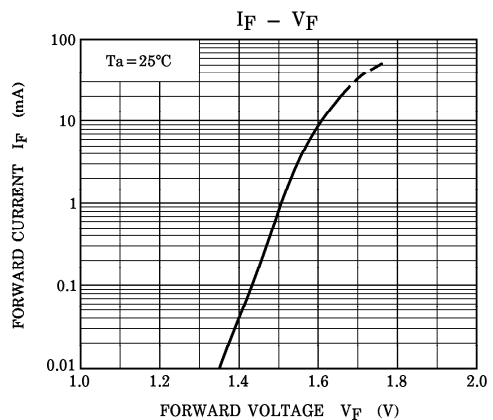
TEST CIRCUIT 2. Transient Immunity and Typical Waveforms.



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

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

(TLP2630)



TLP2630 - 6

1996 - 4 - 8

TOSHIBA CORPORATION

(TLP2630)

