

(TLP371)

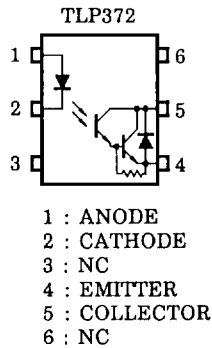
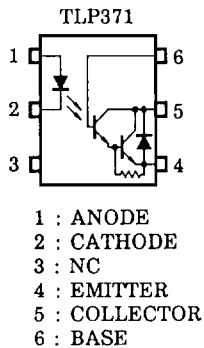
OFFICE MACHINE
 HOUSEHOLD USE EQUIPMENT
 TELECOMMUNICATION
 SOLID STATE RELAY
 PROGRAMMABLE CONTROLLERS

The TOSHIBA TLP371 and TLP372 consists of a gallium arsenide infrared emitting diode optically coupled to a darlington connected photo-transistor which has an integrated base-emitter resistor to optimize switching speed and elevated temperature characteristics in a six lead plastic DIP package.

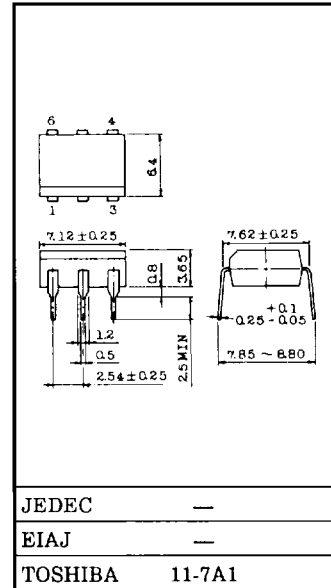
TLP372 is no-base internal connection for high-EMI environments.

- Current Transfer Ratio : 1000% (Min.) ($I_F = 1\text{mA}$)
- Isolation Voltage : 5000Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

PIN CONFIGURATIONS (TOP VIEW)



Unit in mm



Weight : 0.4g

TLP371,372

(TLP371)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F	60	mA
	Forward Current Derating (Ta ≥ 39°C)	ΔI _F /°C	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I _{FP}	1	A
	Reverse Voltage	V _R	5	V
	Junction Temperature	T _j	125	°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	300	V
	Collector-Base Voltage (TLP371)	V _{CB0}	300	V
	Emitter-Collector Voltage	V _{ECO}	0.3	V
	Emitter-Base Voltage (TLP371)	V _{EBO}	7	V
	Collector Current	I _C	150	mA
	Power Dissipation	P _C	300	mW
	Power Dissipation Derating (Ta ≥ 25°C)	ΔP _C /°C	-3.0	mW/°C
	Junction Temperature	T _j	125	°C
Storage Temperature Range		T _{stg}	-55~125	°C
Operating Temperature Range		T _{opr}	-55~100	°C
Lead Soldering Temperature (10 sec.)		T _{sold}	260	°C
Total Package Power Dissipation		P _T	350	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)		ΔP _T /°C	-3.5	mW/°C
Isolation Voltage (AC, 1 min., RH ≤ 60%) (Note 1)		BV _S	5000	Vrms

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

(TLP371)

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.1\text{mA}$	300	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	0.3	—	—	V
	Collector-Base Breakdown Voltage (TLP371)	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}$	300	—	—	V
	Emitter-Base Breakdown Voltage (TLP371)	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}$	7	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 200\text{V}$	—	10	200	nA
			$V_{CE} = 200\text{V}$ $T_a = 85^\circ\text{C}$	—	—	20	μA
	Collector Dark Current (TLP371)	I_{CER}	$V_{CE} = 200\text{V}$ $T_a = 85^\circ\text{C}$, $R_{BE} = 10\text{M}\Omega$	—	0.5	10	μA
	Collector Dark Current (TLP371)	I_{CBO}	$V_{CE} = 200\text{V}$	—	0.1	—	nA
	DC Forward Current Gain (TLP371)	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	—	7000	—	—
Capacitance (Collector to Emitter)	C_{CE}	$V = 0, f = 1\text{MHz}$	—	10	—	pF	

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 1\text{mA}, V_{CE} = 1\text{V}$	1000	4000	—	%
Saturated CTR	$I_C / I_{F(sat)}$	$I_F = 10\text{mA}, V_{CE} = 1\text{V}$	500	—	—	%
Base Photo-Current (TLP371)	I_{PB}	$I_F = 1\text{mA}, V_{CB} = 1\text{V}$	—	6	—	μA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_F = 1\text{mA}$	—	—	1.0	V
		$I_C = 100\text{mA}, I_F = 10\text{mA}$	0.3	—	0.2	

TLP371, 372

(TLP371)

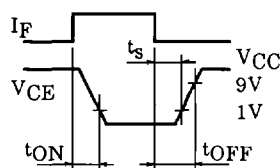
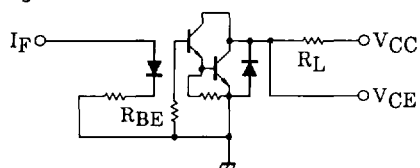
ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance (Input to Output)	C _S	V _S =0, f=1MHz	—	0.8	—	pF
Isolation Resistance	R _S	V _S =500V	5×10 ¹⁰	10 ¹⁴	—	Ω
Isolation Voltage	BV _S	AC, 1 minute	5000	—	—	V _{rms}
		AC, 1 second	—	10000	—	
		DC, 1 minute	—	10000	—	V _{dc}

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	t _r	V _{CC} =10V I _C =10mA R _L =100Ω	—	40	—	μs
Fall Time	t _f		—	15	—	
Turn-on Time	t _{on}		—	50	—	
Turn-off Time	t _{off}		—	15	—	
Turn-on Time	t _{ON}	R _L =180Ω (Fig.1)	—	3	—	μs
Storage Time	t _s	R _{BE} =OPEN	—	45	—	
Turn-off Time	t _{OFF}	V _{CC} =10V, I _F =16mA	—	90	—	
Turn-on Time	t _{ON}	R _L =180Ω (Fig.1)	—	5	—	μs
Storage Time	t _s	R _{BE} =10MΩ (TLP371)	—	40	—	
Turn-off Time	t _{OFF}	V _{CC} =10V, I _F =16mA	—	80	—	

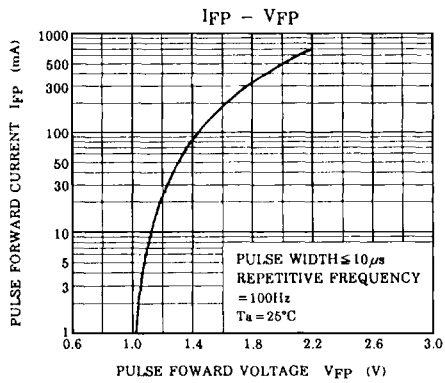
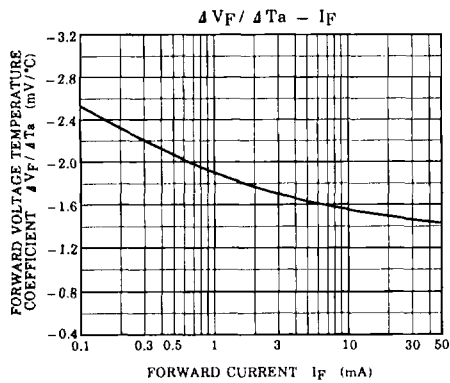
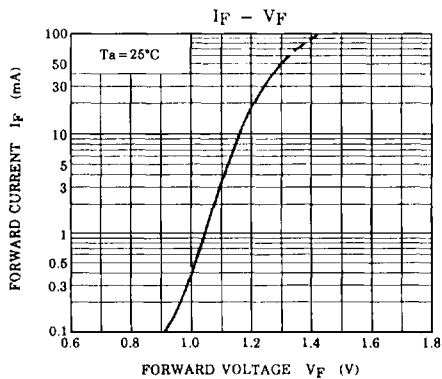
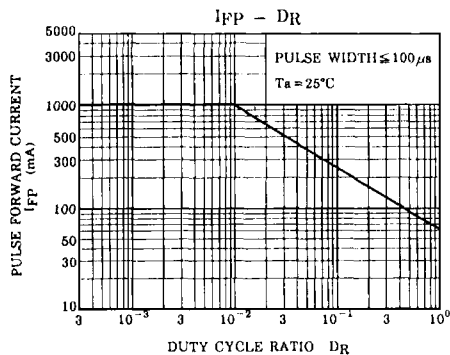
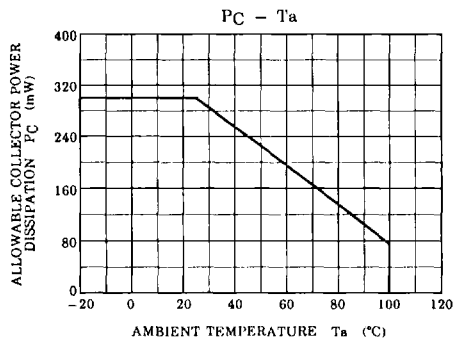
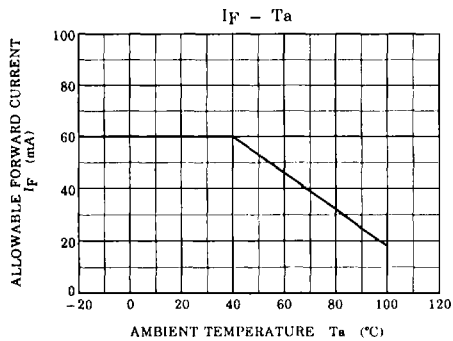
Fig.1 SWITCHING TIME TEST CIRCUIT



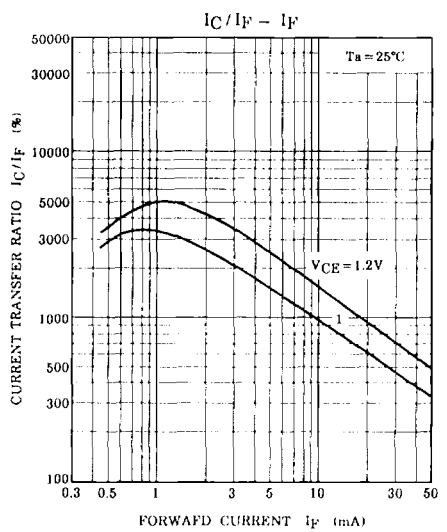
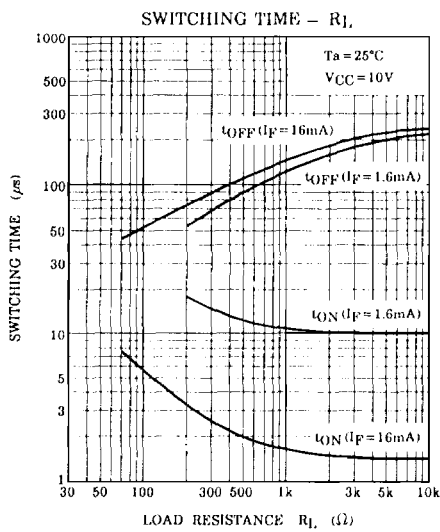
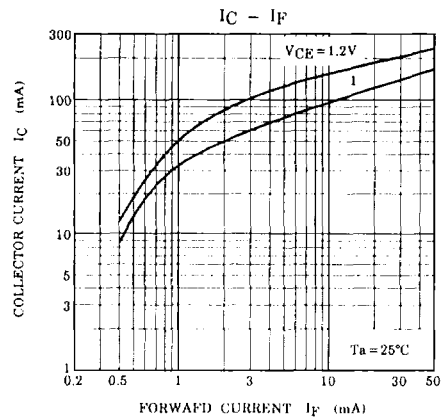
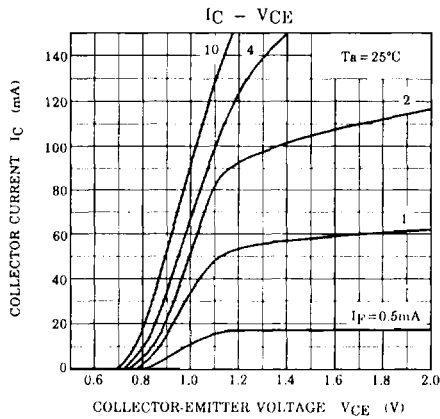
RECOMMENDS OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	—	—	200	V
Forward Current	I _F	—	16	25	mA
Collector Current	I _C	—	—	120	mA
Operating Temperature	T _{opr}	-25	—	85	°C

(TLP371)



(TLP371)



(TLP371)

