

TOSHIBA PHOTOCOUPLER IRED & PHOTO-TRANSISTOR

# TLP572

PROGRAMMABLE CONTROLLERS

AC/DC-INPUT MODULE

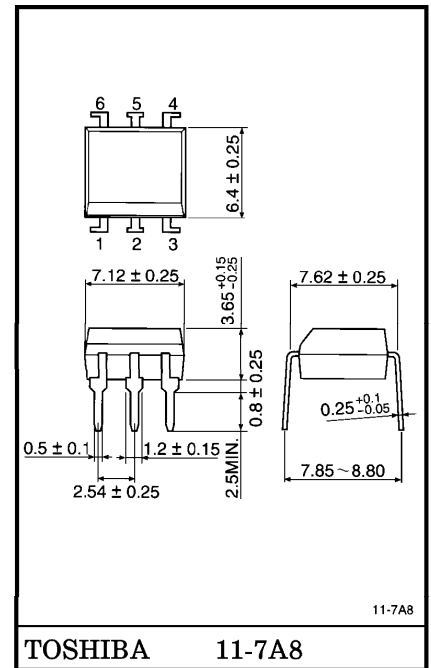
SOLID STATE RELAY

The TOSHIBA TLP572 consists of a darlington connected photo-transistor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

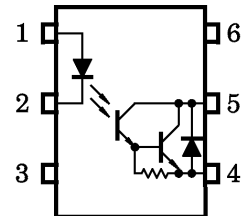
TLP572 is no-base internal connection for high-EMI environments.

- Collector-Emitter Voltage : 55V (Min.)
- Current Transfer Ratio : 1000% (Min.)
- Isolation Voltage : 2500Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



PIN CONFIGURATIONS (TOP VIEW)



- 1 : ANODE
- 2 : CATHODE
- 3 : NC
- 4 : EMITTER
- 5 : COLLECTOR
- 6 : NC

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 53°C)	I <sub>F</sub> /°C	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I <sub>FP</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Collector-Emitter Voltage	V <sub>CEO</sub>	55	V
	Emitter-Collector Voltage	V <sub>ECO</sub>	0.3	V
	Collector Current	I <sub>C</sub>	150 / -10	mA
	Power Dissipation	P <sub>C</sub>	150	mW
	Power Dissipation Derating (Ta ≥ 25°C)	P <sub>C</sub> /°C	-1.5	mW/°C
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature Range		T <sub>stg</sub>	-55~125	°C
Operating Temperature Range		T <sub>opr</sub>	-30~85	°C
Lead Soldering Temperature (10s)		T <sub>sol</sub>	260	°C
Total Package Power Dissipation		P <sub>T</sub>	200	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)		P <sub>D</sub> /°C	-2.6	mW/°C
Isolation Voltage (AC, 1min., R.H. ≤ 60%) (Note 1)		BV <sub>S</sub>	2500	V <sub>rms</sub>

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

## RECOMMEND OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>CC</sub>	—	12	24	V
Forward Current	I <sub>F</sub>	—	—	25	mA
Collector Current	I <sub>C</sub>	—	—	40	mA
Operating Temperature	T <sub>opr</sub>	-30	—	85	°C

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	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	55	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	0.3	—	—	V
	Collector Dark Current	$I_{CEO}$	$V_{CE} = 24\text{V}$	—	10	200	nA
			$V_{CE} = 24\text{V}, T_a = 85^\circ\text{C}$	—	0.5	10	$\mu\text{A}$
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	$I_C / I_F$	$I_F = 1\text{mA}, V_{CE} = 1.2\text{V}$	1000	2000	—	%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_F = 10\text{mA}$	0.3	—	1.2	V

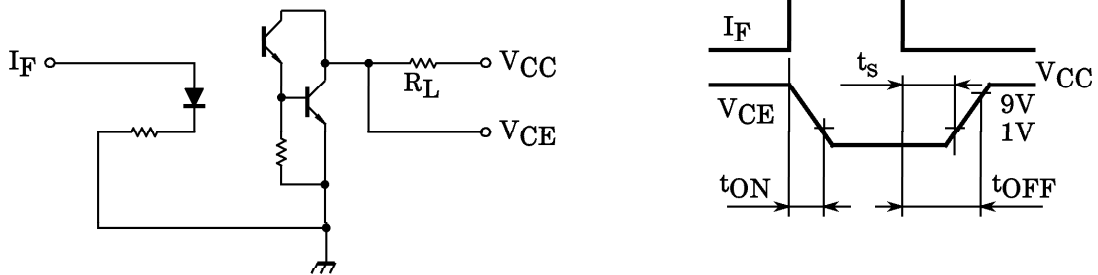
ISOLATION CHARACTERISTICS (Ta = 25°C)

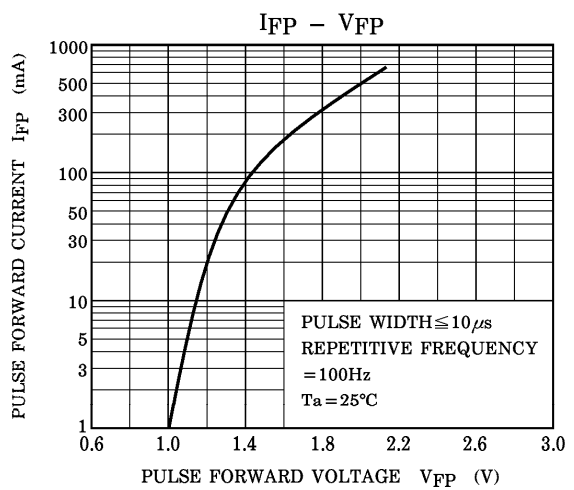
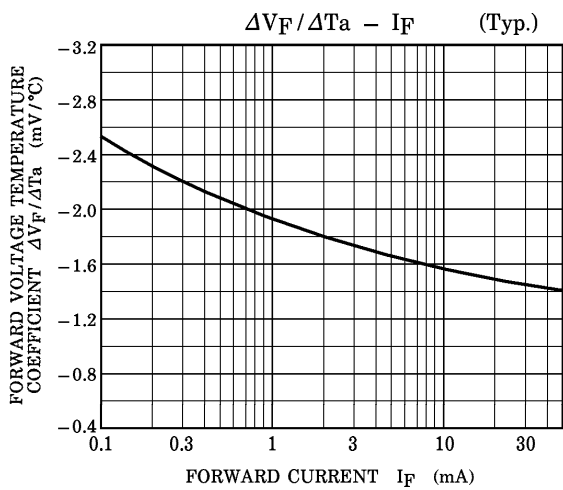
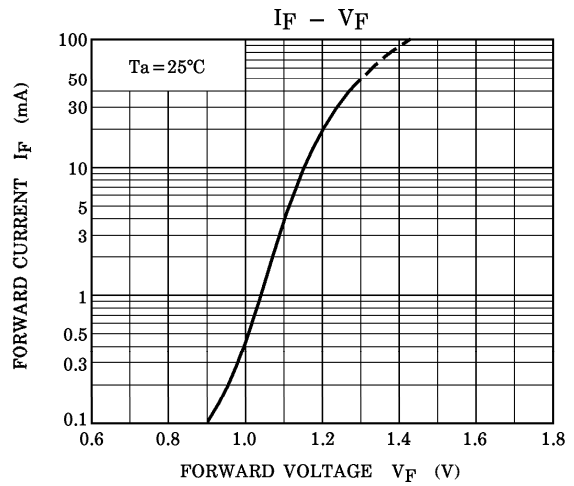
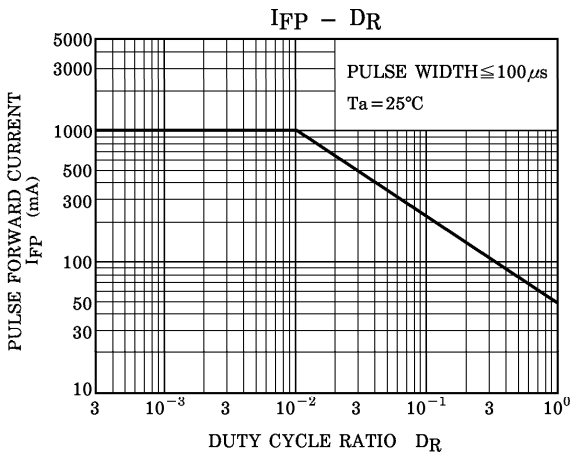
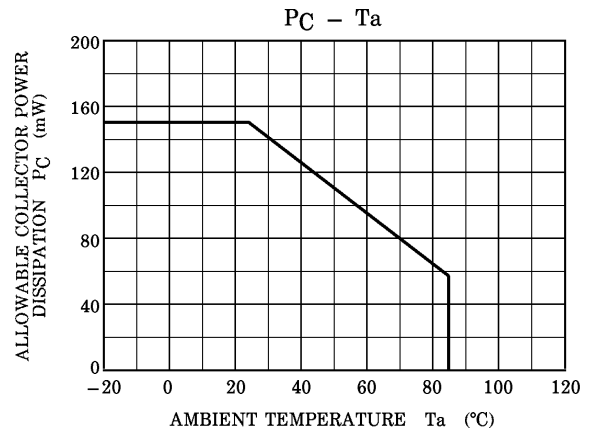
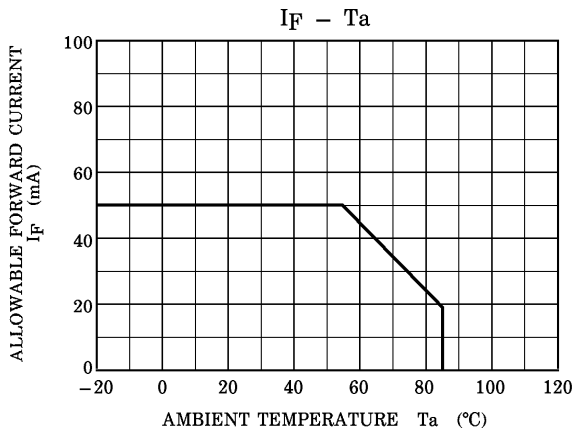
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance (Input to Output)	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500\text{V}, R.H. \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
AC Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{rms}$

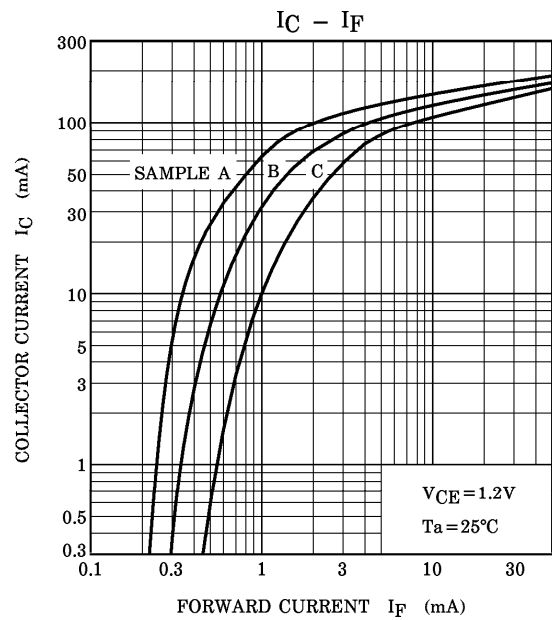
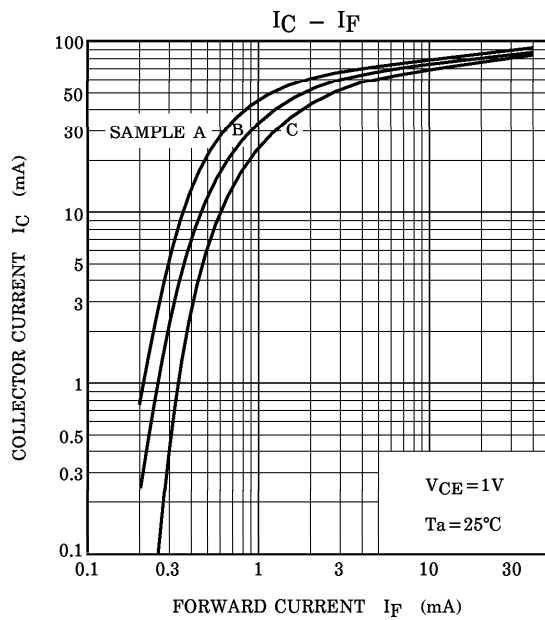
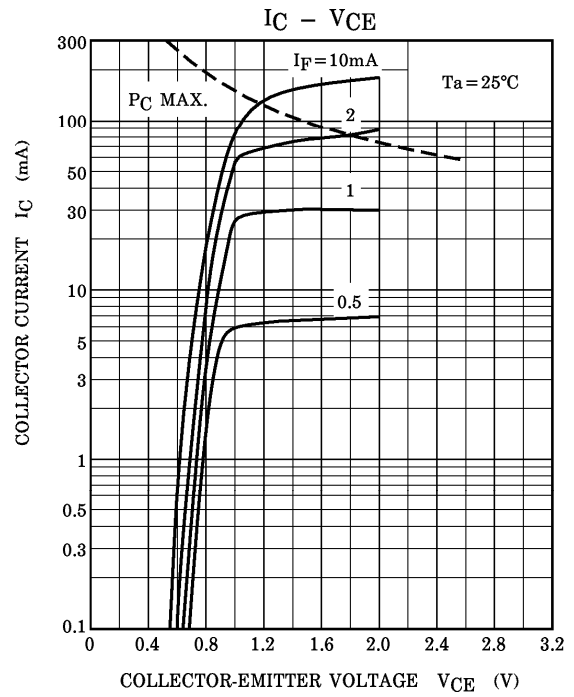
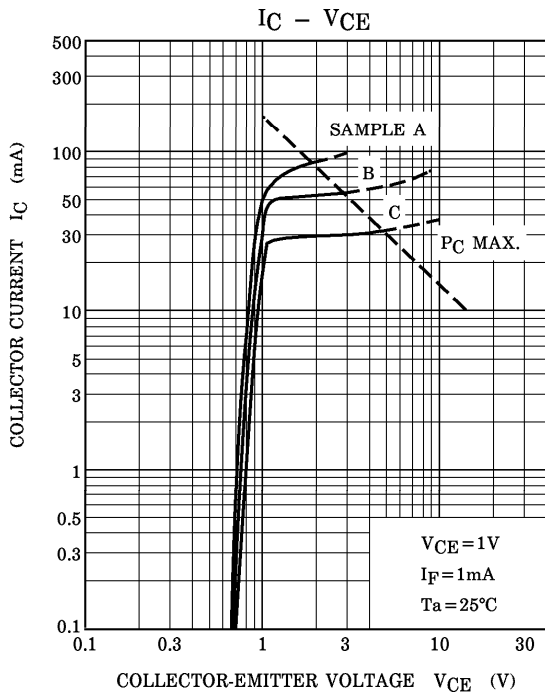
SWITCHING CHARACTERISTICS (Ta = 25°C)

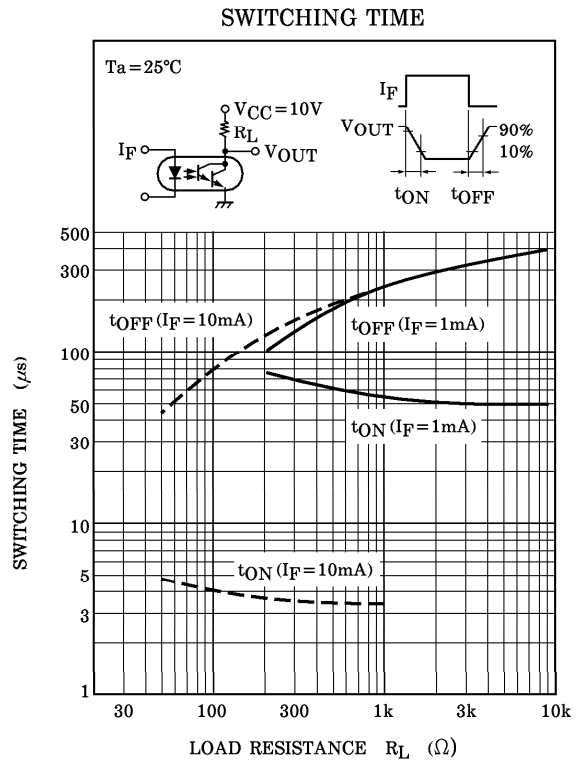
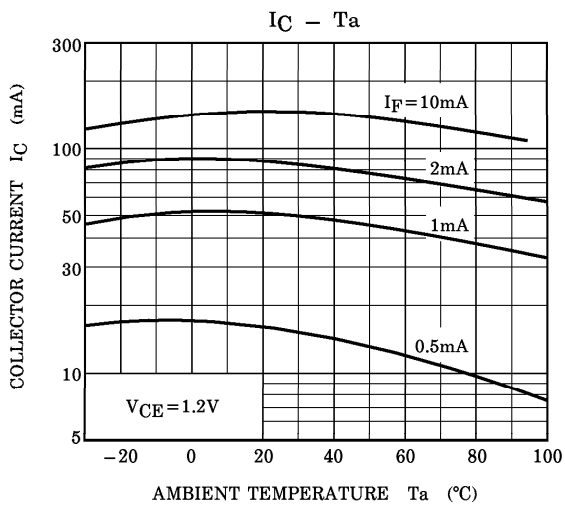
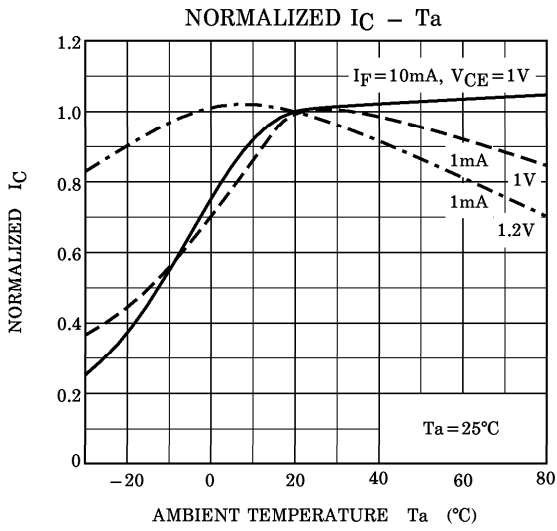
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	$t_r$	$V_{CC} = 10V, I_C = 10mA$ $R_L = 100\Omega$	—	—	—	$\mu S$
Fall Time	$t_f$		—	—	—	
Turn-on Time	$t_{on}$		—	—	—	
Turn-off Time	$t_{off}$		—	—	—	
Turn-on Time	$t_{ON}$	$R_L = 180\Omega$ (Fig.1) $V_{CC} = 10V, I_F = 10mA$	—	3	—	$\mu S$
Storage Time	$t_s$		—	—	—	
Turn-off Time	$t_{OFF}$		—	30	—	

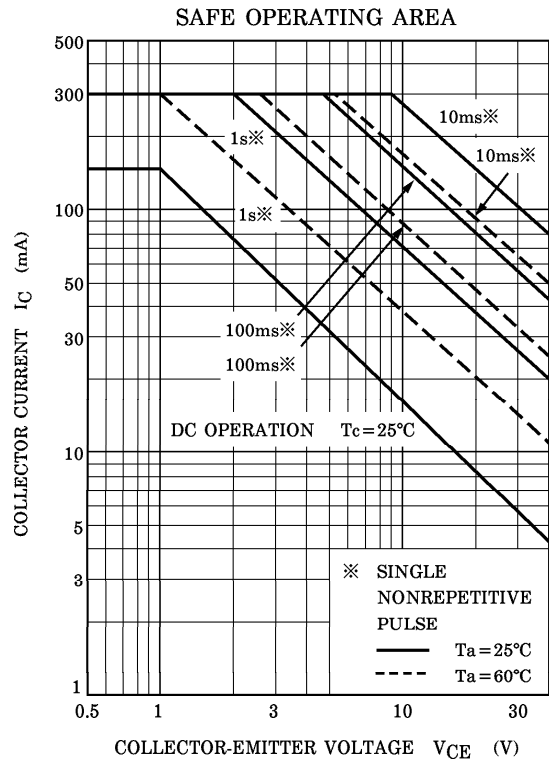
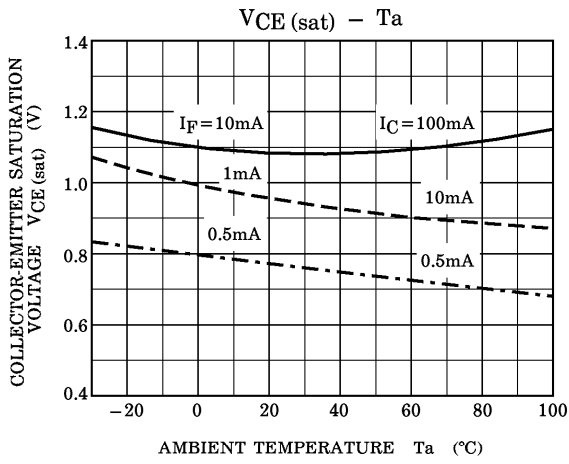
Fig.1 SWITCHING TIME TEST CIRCUIT













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