

TLP172A

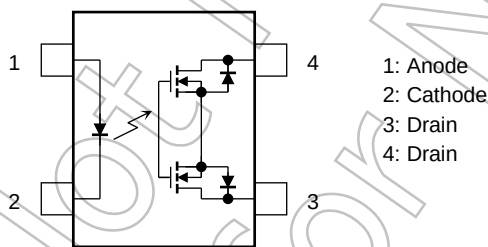
Telecommunications
Control Equipment
Data Acquisition System
Security Equipment
Measurement Equipment

The Toshiba TLP172A consists of an infrared emitting diode optically coupled to a photo-MOSFET in a 4-pin SOP package. This photorelay has higher output current rating than phototransistor-type photocoupler; hence, it is suitable for use as On/Off control for high current.

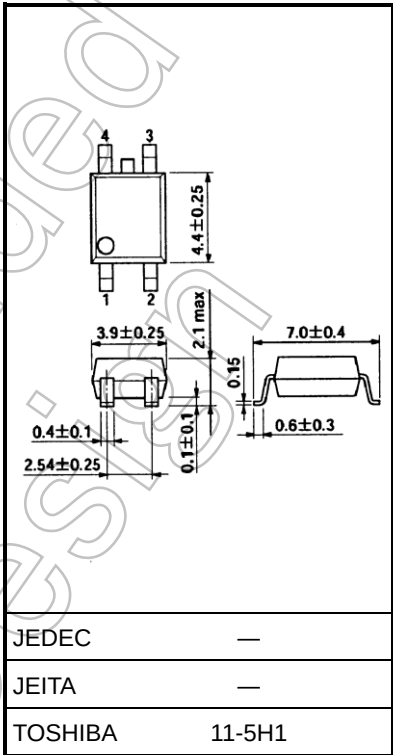
- 4-pin SOP (2.54SOP4): Height = 2.1 mm, pitch = 2.54 mm
- Normally open (1-form-A) device
- Peak off-state voltage: 60 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 400 mA (max)
- On-state resistance: 2 Ω (max)
- Isolation voltage: 1500 Vrms (min)
- UL-recognized: UL 1557, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A
File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1: When a VDE approved type is needed,
please designate the **Option(V4)**.

Pin Configuration (top view)



Unit: mm



Weight: 0.1 g (typ.)

Start of commercial production
2002-03

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
LED	Forward current	I _F	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F /°C	-0.5	mA/°C
	Reverse voltage	V _R	5	V
	Diode power dissipation	P _D	50	mW
	Diode power dissipation derating (Ta ≥ 25°C)	ΔP _D /°C	-0.5	mW/°C
	Junction temperature	T _j	125	°C
Detector	Off-state output terminal voltage	V _{OFF}	60	V
	On-state current	I _{ON}	400	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _{ON} /°C	-4.0	mA/°C
	Output power dissipation	P _C	290	mW
	Output power dissipation derating (Ta ≥ 25°C)	ΔP _C /°C	-2.9	mW/°C
	Junction temperature	T _j	125	°C
Storage temperature		T _{stg}	-55 to 125	°C
Operating temperature		T _{opr}	-40 to 85	°C
Lead soldering temperature (10 s)		T _{sol}	260	°C
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 1)		BV _S	1500	V _{rms}

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Note 1: LED pins are shorted together. Detector pins are also shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V _{DD}	—	—	48	V
Forward current	I _F	5	7.5	25	mA
On-state current	I _{ON}	—	—	400	mA
Operating temperature	T _{opr}	-20	—	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
	Reverse current	I _R	V _R = 5 V	—	—	10	μA
	Capacitance	C _T	V = 0 V, f = 1 MHz	—	30	—	pF
Detector	Off-state current	I _{OFF}	V _{OFF} = 60 V	—	—	1	μA
	Capacitance	C _{OFF}	V = 0 V, f = 1 MHz	—	130	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	IFT	ION = 400 mA	—	1.6	3	mA
Return LED current	IFC	IOFF = 100 μA	0.1	—	—	mA
On-state resistance	RON	ION = 400 mA, IF = 5 mA	—	1	2	Ω

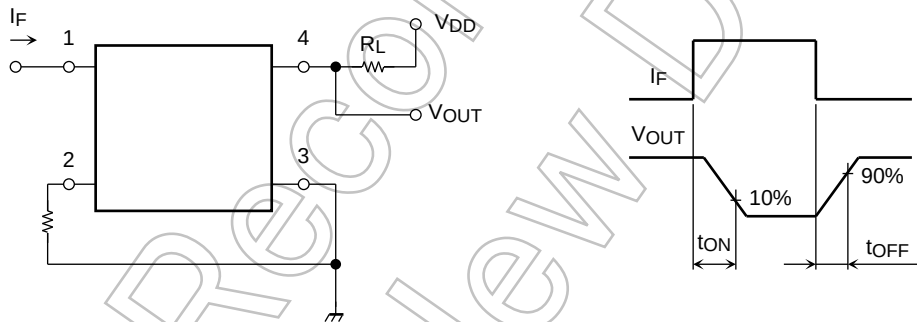
Isolation Characteristics (Ta = 25°C)

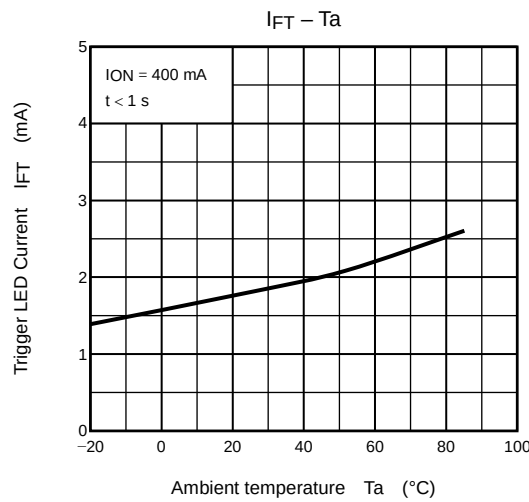
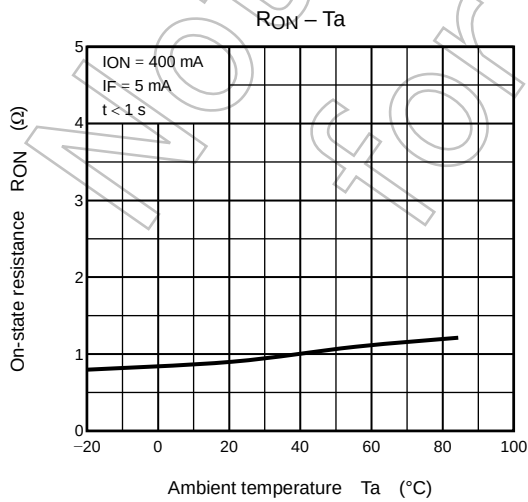
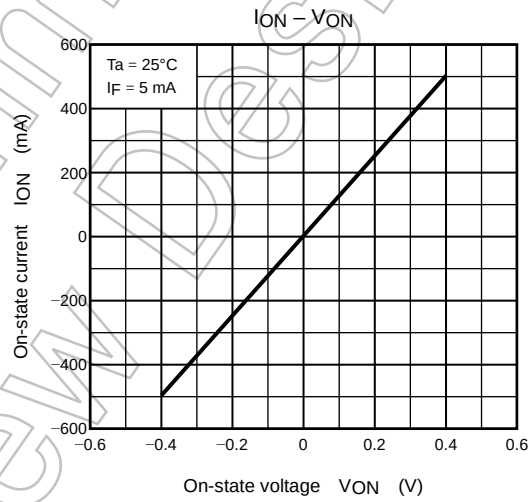
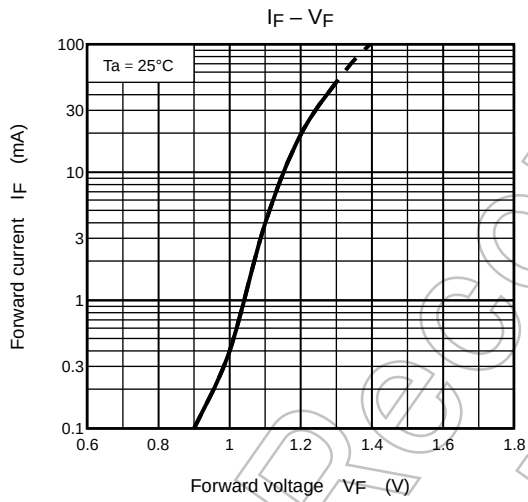
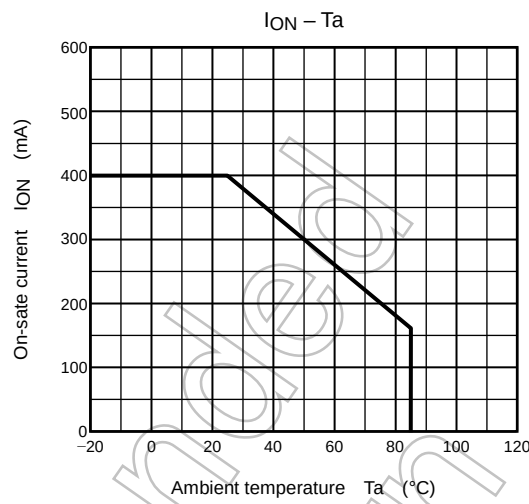
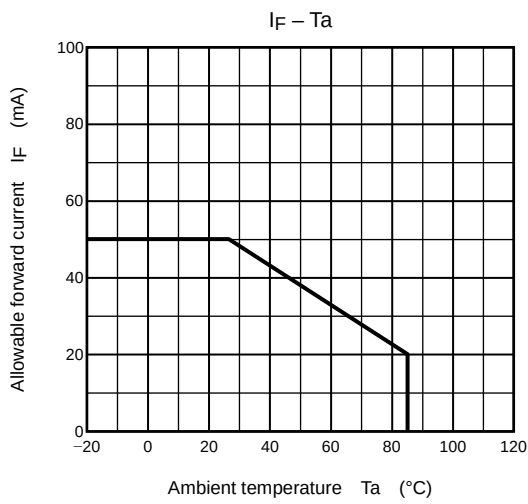
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	CS	VS = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	RS	VS = 500 V, R.H. ≤ 60 %	5 × 10 ¹⁰	10 ¹⁴	—	Ω
Isolation voltage	BVS	AC, 60 s	1500	—	—	Vrms

Switching Characteristics (Ta = 25°C)

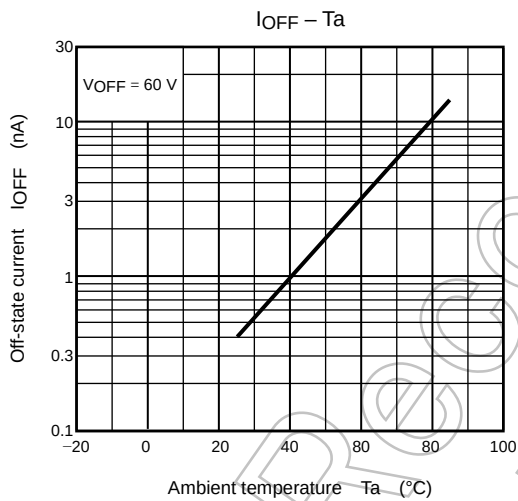
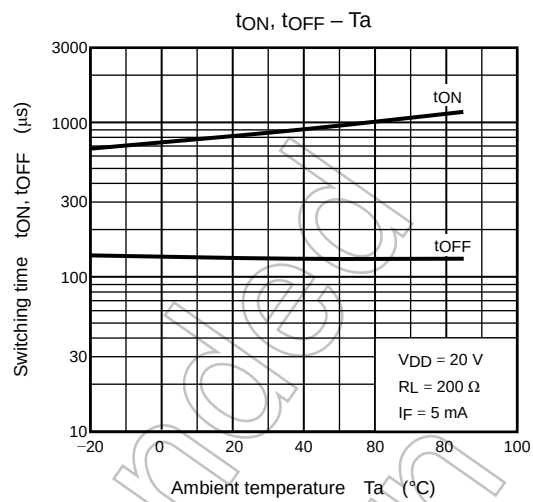
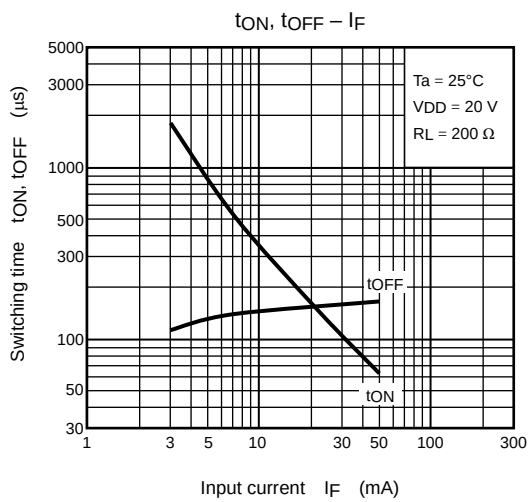
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	tON	RL = 200 Ω (Note 2) VDD = 20 V, IF = 5 mA	—	0.8	2	ms
Turn-off time	tOFF		—	0.1	0.5	

Note 2: Switching time test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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