TOSHIBA Photocoupler Photorelay

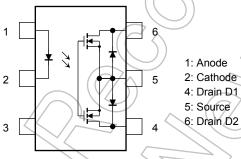
TLP592A

Telecommunications Measurement and Control Equipment **Data Acquisition System** Measurement Equipment

The Toshiba TLP592A consists of an infrared emitting diode optically coupled to a photo-MOSFET in a 6-pin DIP 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.

- Normally open (1-form-A) device
- Peak off-state voltage: 60 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 500 mA (max)
- On-state resistance: 2Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL-recognized: UL 1557, File No.E67349

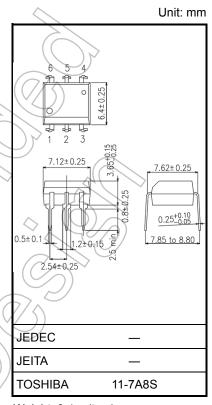
Pin Configuration (top view)



1: Anode

4: Drain D1

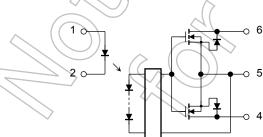
5: Source



Weight: 0.4 g (typ.)



Schematic



Start of commercial production 2002-03

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit		
	Forward current		lF	50	mA	
	Forward current derating (Ta ≥ 25°C)		ΔIF/°C	-0.5	mA/°C	
LED	Peak forward current (100 µs pulse, 100 pps)		IFP	1	А	
	Reverse voltage		VR	5	V	
	Junction temperature		Tj	125	°C	
	Off-state output terminal voltage		Voff	60	V	
	On-state current	A connection	Ion	500	mA	
		B connection		500		
Detector		C connection		1000		
	Forward current derating	A connection	Δl _{ON} /°C	-5.0		
		B connection		-5.0	mA/°C	7
	(Ta ≥ 25°C)	C connection		-10.0		\$ 32
	Junction temperature		Tj	125	(//c))	6 (O)
Storage temperature		T _{stg}	-55 to 125	မှ	· A TE	
Operating temperature		Topr	-40 to 85	°C		
Lead soldering temperature (10 s)		T _{sol}	260	°C		
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 1)		BVS	2500	Vrms		

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).

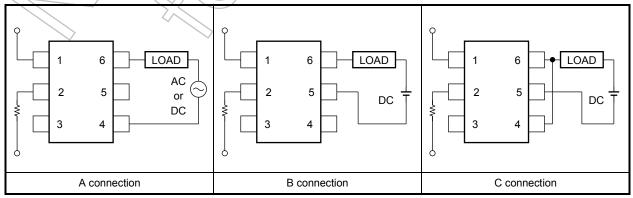
Note 1: LED pins are shorted together. Detector pins are also shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	ур.	Max	Unit
Supply voltage	V_{DD}		/_	48	V
Forward current	F	5	7.5	25	mA
On-state current	Ion	_	_	500	mA
Operating temperature	Topr	<u></u> –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.

Circuit Connections



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Electrical Characteristics Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
	Forward voltage	VF	I _F = 10 mA	1.0	1.15	1.3	V
LED	Reverse voltage	I _R	V _R = 5 V	_	_	10	μА
	Capacitance	CT	V = 0 V, f = 1 MHz	/-	30	_	pF
Detector	Off-state current	loff	Voff = 60 V		_	1	μА
	Capacitance	Coff	V = 0 V, f = 1 MHz		130	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current		lfT	ION = 500 mA	_	1.6	3	mA
Return LED current		IFC	IOFF = 100 μA	0.1	47	\nearrow	mA
	A connection		ION = 500 mA, IF= 5 mA	7	1	2	
On-state resistance	B connection	RON	I _{ON} = 500 mA, I _F = 5 mA	7	0.5	1	Ω
	C connection		ION = 1000 mA, IF= 5 mA		0.25		

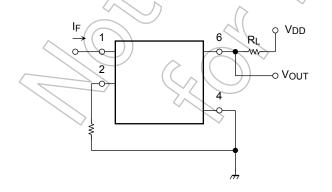
Isolation Characteristics (Ta = 25°C)

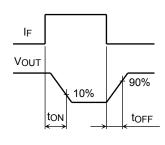
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	V _S = 0 V, f = 1 MHz	_	0.8	_	pF
Isolation resistance	Rs	V _S = 500 V, R.H. ≤ 60 %	5 × 10 ¹⁰	10 ¹⁴	_	Ω
Isolation voltage	BVS	AC, 60 s	2500	_		Vrms

Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition		Min	Тур.	Max	Unit
Turn-on time	ton	$R_L = 200 \Omega$	(Note 2)	_	0.8	2	mo
Turn-off time	toff	$V_{DD} = 20 \text{ V, I}_{F} = 5 \text{ mA}$		_	0.1	0.5	ms

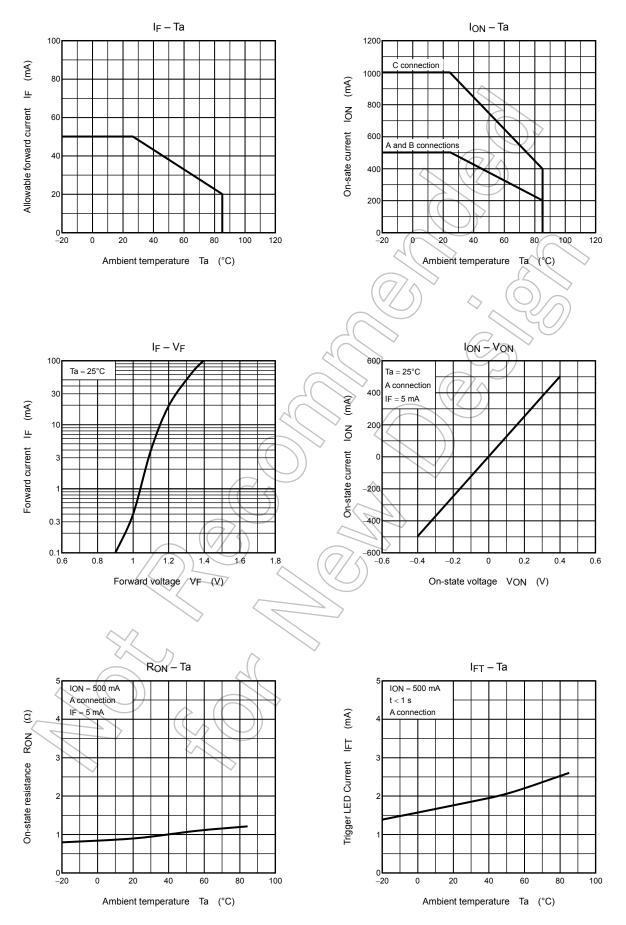
Note 2: Switching time test circuit





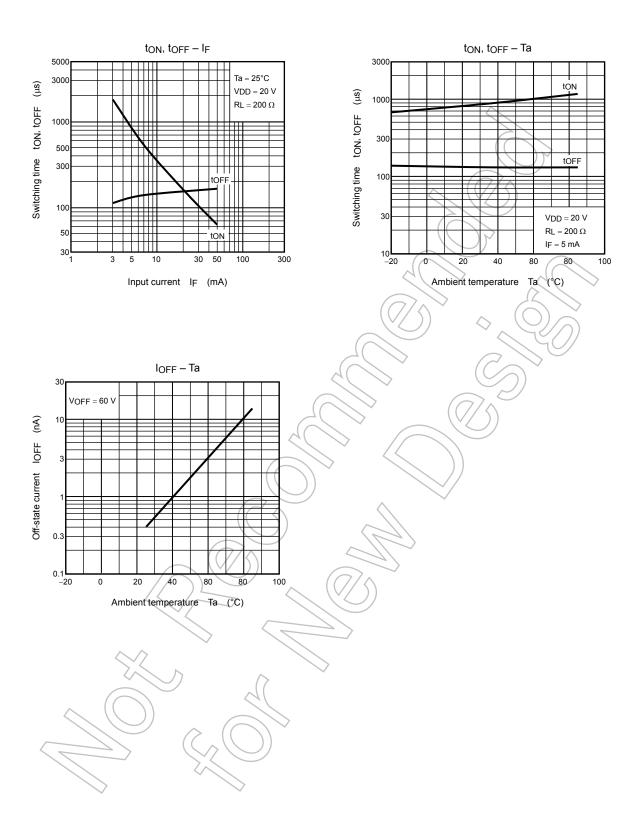
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2019-06-24



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

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