

TOSHIBA PHOTOCOUPLER GaAs IRED &amp; PHOTO-TRIAC

**TLP3061(S),TLP3062(S),TLP3063(S)**

OFFICE MACHINE  
 HOUSEHOLD USE EQUIPMENT  
 TRIAC DRIVER  
 SOLID STATE RELAY

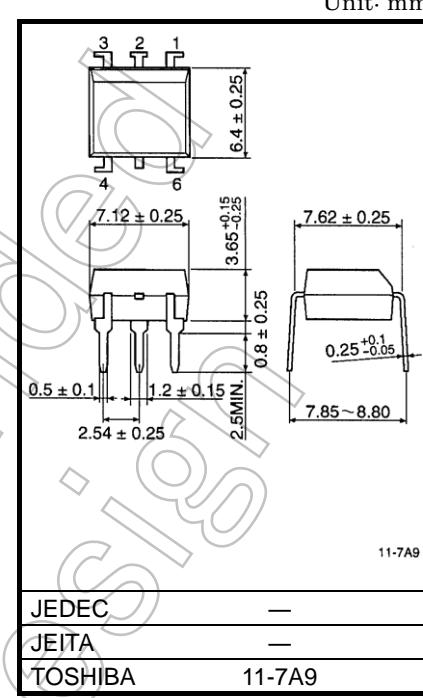
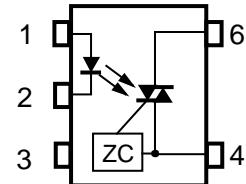
The TOSHIBA TLP3061 (S), TLP3062 (S), TLP3063 (S) consist of a zero voltage crossing turn-on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak Off-State Voltage : 600 V (min)
- Trigger LED Current : 15 mA (max) (TLP3061(S))  
                           10 mA (max) (TLP3062(S))  
                           5 mA (max) (TLP3063(S))
- On-State Current : 100 mA (max)
- Isolation Voltage : 5000 Vrms (min)
- UL approved: UL1577, File No.E67349
- cUL approved :CSA Component Acceptance Service  
                           No. 5A, File No.E67349
- CQC approved: GB4943.1,GB8898 Japan Factory  
     Option (D4) VDE approved : DIN EN60747-5-5 ,EN60065,EN60950-1 (Note1)  
     EN62368-1(Pending) (Note1)

(Note 1):When a VDE approved type is needed,  
 please designate the "Option (D4)"

- Construction mechanical rating

	7.62 mm pitch Standard Type	10.16 mm pitch TLPxxxxF type
Creepage Distance	7.0 mm (Min)	8.0 mm (Min)
Clearance	7.0 mm (Min)	8.0 mm (Min)
Insulation Thickness	0.5 mm (Min)	0.5 mm (Min)

**Pin Configuration  
(top view)**

1: Anode  
 2: Cathode  
 3: N.C.  
 4: Terminal 1  
 6: Terminal 2

ZC:Zero-cross Circuit

Start of commercial production  
 1996-09

## Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I <sub>F</sub>	50	mA
	Forward current derating (Ta ≥ 53°C)	ΔI <sub>F</sub> / °C	-0.7	mA / °C
	Peak forward current (100 µs pulse, 100 pps)	I <sub>FP</sub>	1	A
	Power dissipation	P <sub>D</sub>	100	mW
	Power dissipation derating (Ta ≥ 53°C)	ΔP <sub>D</sub> / °C	-1.4	mW / °C
	Reverse voltage	V <sub>R</sub>	5	V
	Junction temperature	T <sub>j</sub>	125	°C
Detector	Off-state output terminal voltage	V <sub>DRM</sub>	600	V
	On-state RMS current	I <sub>T</sub> (RMS)	100	mA
			50	
	On-state current derating (Ta ≥ 25°C)	ΔI <sub>T</sub> / °C	-1.1	mA / °C
	Peak on-state current (100µs pulse, 120 pps)	I <sub>TP</sub>	2	A
	Peak nonrepetitive surge current (P <sub>w</sub> = 10 ms)	I <sub>TSM</sub>	1.2	A
	Power dissipation	P <sub>D</sub>	300	mW
	Power dissipation derating (Ta ≥ 25°C)	ΔP <sub>D</sub> / °C	-4.0	mW / °C
	Junction temperature	T <sub>j</sub>	115	°C
	Storage temperature range	T <sub>stg</sub>	-55 to 150	°C
	Operating temperature range	T <sub>opr</sub>	-40 to 100	°C
	Lead soldering temperature (10 s)	T <sub>sol</sub>	260	°C
Total package power dissipation		P <sub>T</sub>	330	mW
Total package power dissipation derating (Ta ≥ 25°C)		ΔP <sub>T</sub> / °C	-4.4	mW / °C
Isolation voltage (AC, 1 min., R.H.≤ 60%) (Note 1)		BVs	5000	V <sub>rms</sub>

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

## Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V <sub>AC</sub>	—	—	240	Vac
Forward current	I <sub>F</sub> *	15	20	25	mA
Peak on-state current	I <sub>TP</sub>	—	—	1	A
Operating temperature	T <sub>opr</sub>	-25	—	85	°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.

\* In the case of TLP3062

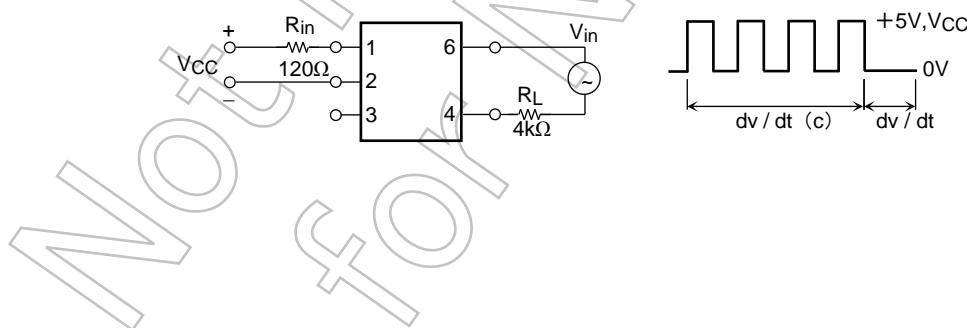
## Individual Electrical Characteristics (Ta = 25°C)

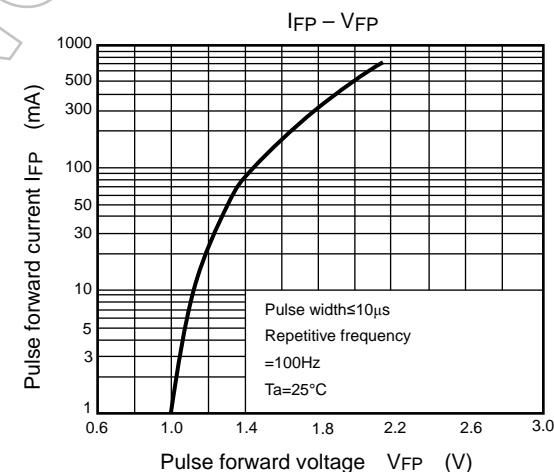
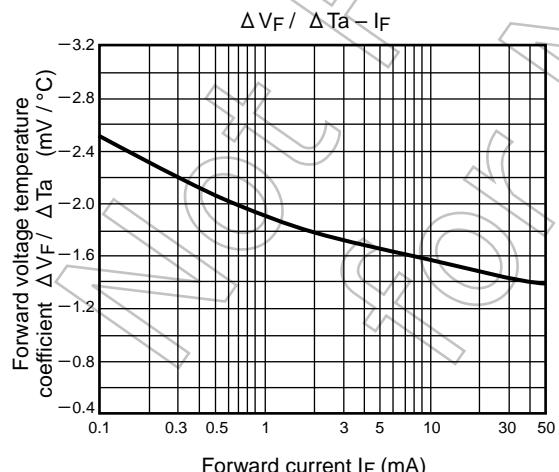
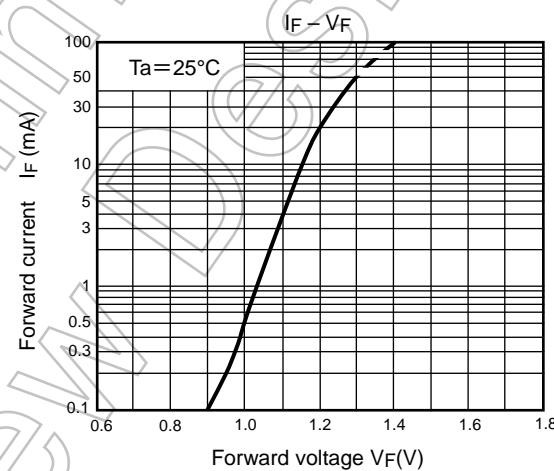
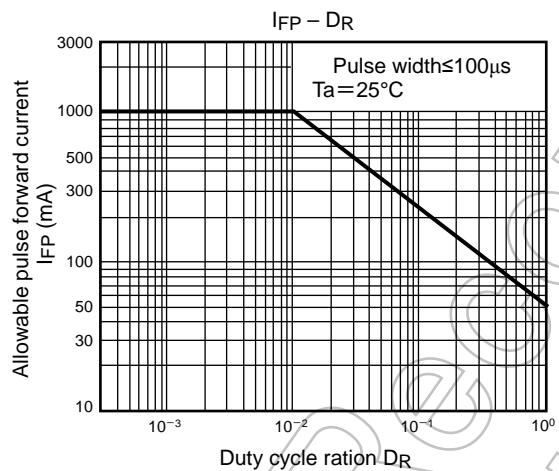
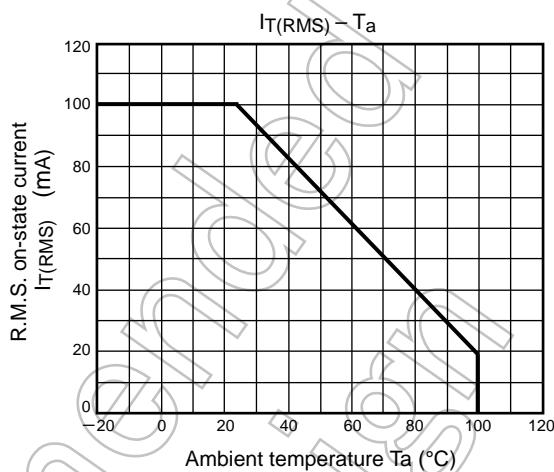
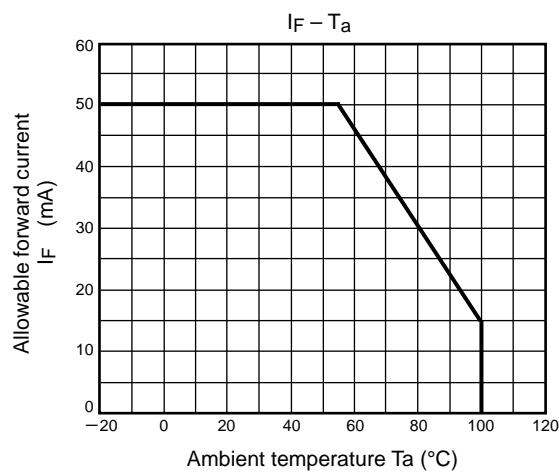
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 5 V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0 V, f = 1 MHz	—	10	—	pF
Detector	Peak off-state current	I <sub>DRM</sub>	V <sub>DRM</sub> = 600 V	—	10	1000	nA
	Peak on-state voltage	V <sub>TM</sub>	I <sub>TM</sub> = 100 mA	—	1.7	3.0	V
	Holding current	I <sub>H</sub>	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv / dt	V <sub>in</sub> = 240 Vrms, Ta = 85°C (Fig.1)	200	500	—	V / μs
	Critical rate of rise of commutating voltage	dv / dt (c)	V <sub>in</sub> = 60 Vrms, I <sub>T</sub> = 15mA (Fig.1)	—	0.2	—	V / μs

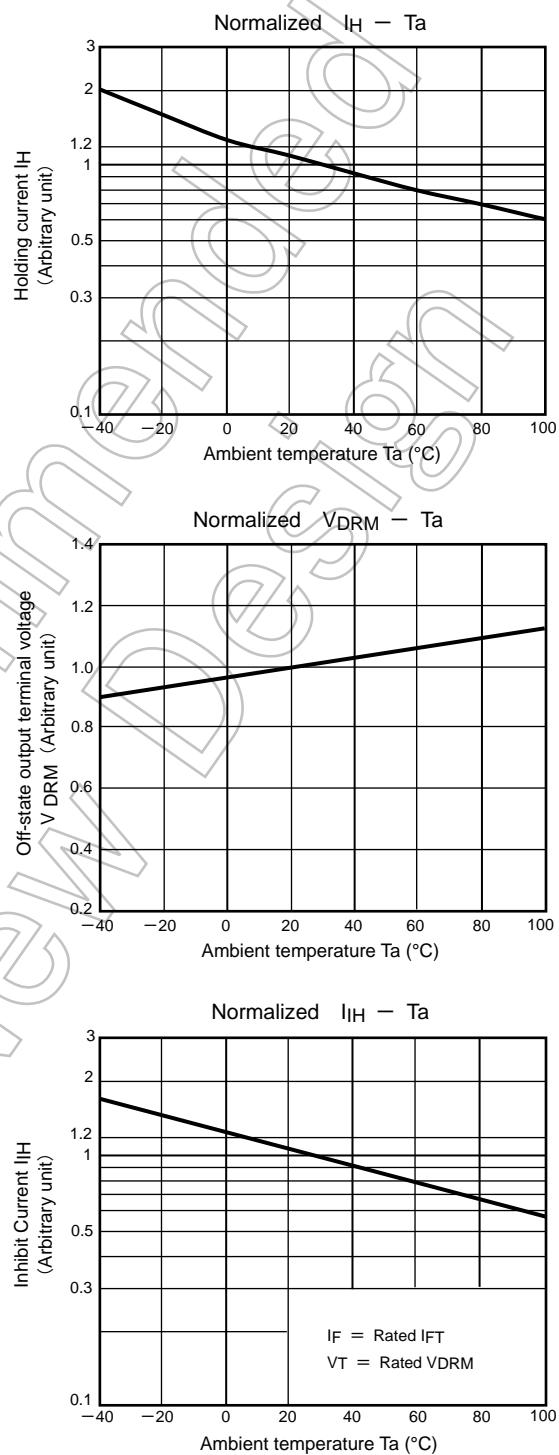
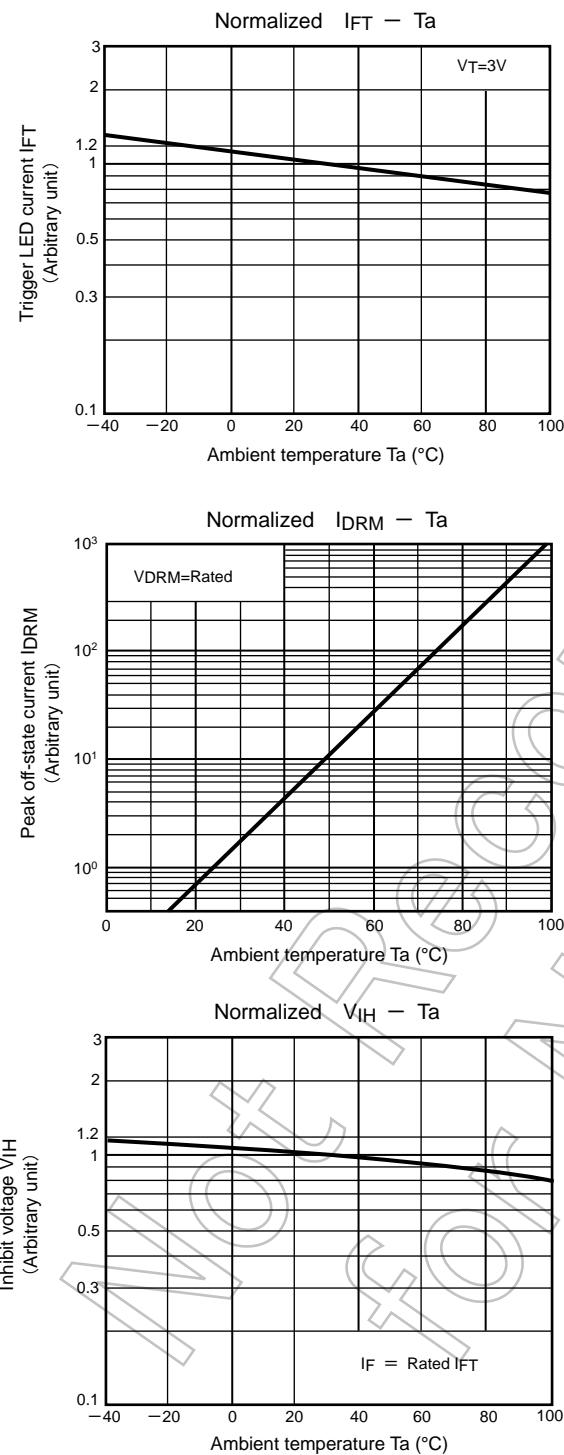
## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	TLP3061(S)	I <sub>FT</sub>	V <sub>T</sub> = 6 V	—	—	15	mA
	TLP3062(S)			—	5	10	
	TLP3063(S)			—	—	5	
Inhibit voltage	V <sub>IH</sub>	I <sub>F</sub> = rated I <sub>FT</sub>	—	—	50	V	
Leakage in inhibited state	I <sub>IH</sub>	I <sub>F</sub> = rated I <sub>FT</sub> V <sub>T</sub> = rated V <sub>DRM</sub>	—	100	300	μA	
Capacitance input to output	C <sub>S</sub>	V <sub>S</sub> = 0 V, f = 1 MHz	—	0.8	—	pF	
Isolation resistance	R <sub>S</sub>	V <sub>S</sub> = 500 V (R.H.≤ 60%)	5×10 <sup>10</sup>	10 <sup>14</sup>	—	Ω	
Isolation voltage	BVs	AC, 1 minute	5000	—	—	Vrms	
			—	10000	—		
		DC, 1 minute, in oil	—	10000	—	V <sub>dc</sub>	

Fig. 1 dv / dt test circuit







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