

TOSHIBA Photocoupler GaAs Ired & Photo-Triac

TLP3051, TLP3052

Office Machine

Household Use Equipment

Triac Driver

Solid State Relay

The TOSHIBA TLP3051 and TLP3052 consist of a 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.) (TLP3051)
10 mA (max.) (TLP3052)
- On-state current: 100 mA (max.)
- UL recognized: UL1577, file no. E67349
Isolation voltage: 5000 Vrms (min.)
- Option (D4) type
VDE approved: DIN VDE0884 / 08.87,
Certificate no. 68329

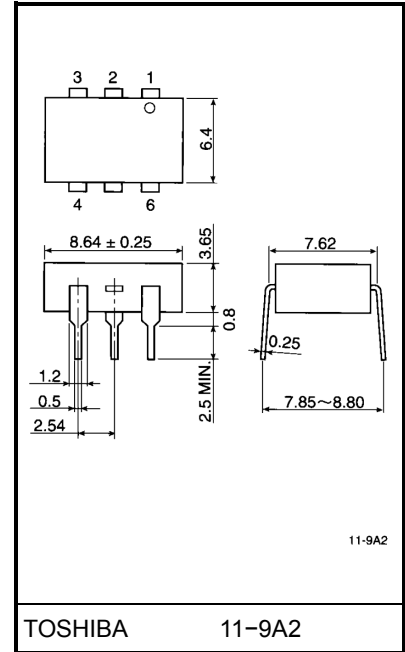
Maximum operating insulation voltage: 630 VPK

Highest permissible over voltage: 6000 VPK

(Note) When a VDE0884 approved type is needed, please designate the "option (D4)"

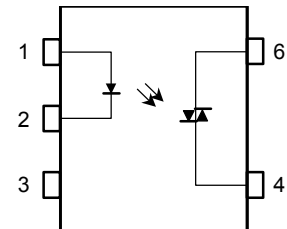
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|-----------------------|-------------------------------|-----------------------------|
| | 7.62 mm pich
standard type | 10.16 mm pich
(LF2) type |
| • Creepage distance: | 7.0 mm (min.) | 8.0 mm (min.) |
| Clearance: | 7.0 mm (min.) | 8.0 mm (min.) |
| Insulation thickness: | 0.5 mm (min.) | 0.5 mm (min.) |

Unit in mm



Weight: 0.44 g

Pin Configuration(top view)



- 1 : Anode
- 2 : Cathode
- 3 : Nc
- 4 : Terminal 1
- 6 : Terminal 2

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F/^\circ\text{C}$	-0.7	mA/°C
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A
	Power dissipation	P_D	100	mW
	Power dissipation derating (Ta ≥ 25°C)	$\Delta P_D/^\circ\text{C}$	-1.0	mW/°C
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	°C
Detector	Off-state output terminal voltage	V_{DRM}	600	V
	On-state RMS current	Ta = 25°C	100	mA
		Ta = 70°C	50	
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T/^\circ\text{C}$	-1.1	mA/°C
	Peak on-state current (100 μs pulse, 120 pps)	I_{TP}	2	A
	Peak nonrepetitive surge current (Pw = 10 ms, DC = 10%)	I_{TSM}	1.2	A
	Power dissipation	P_D	300	mW
	Power dissipation derating (Ta ≥ 25°C)	$\Delta P_D/^\circ\text{C}$	-4.0	mW/°C
Junction temperature	T_j	115	°C	
Storage temperature range		T_{stg}	-55~150	°C
Operating temperature range		T_{opr}	-40~100	°C
Lead soldering temperature (10 s)		T_{sol}	260	°C
Total package power dissipation		P_T	330	mW
Total package power dissipation derating (Ta ≥ 25°C)		$\Delta P_T/^\circ\text{C}$	-4.4	mW/°C
Isolation voltage (AC, 1 min., R.H. ≤ 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 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	240	Vac
Forward current	I_F^*	15	20	25	mA
Peak on-state current	I_{TP}	—	—	1	A
Operating temperature	T_{opr}	-25	—	85	°C

※ In the case of TLP3052

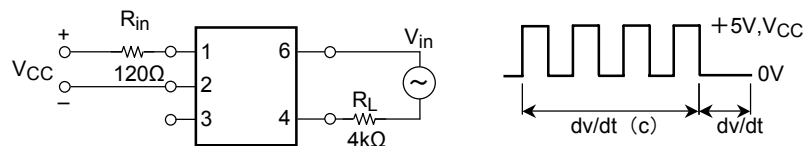
Individual Electrical Characteristics (Ta = 25°C)

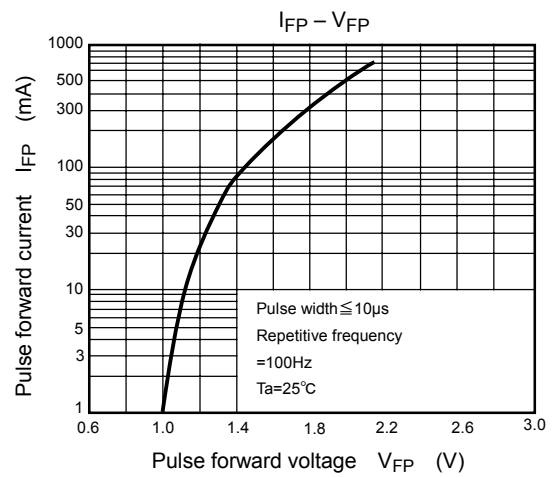
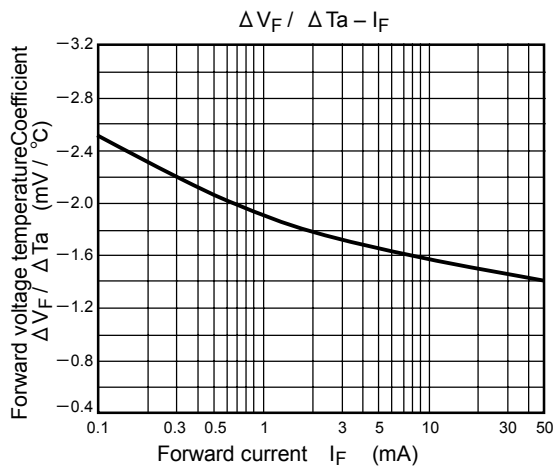
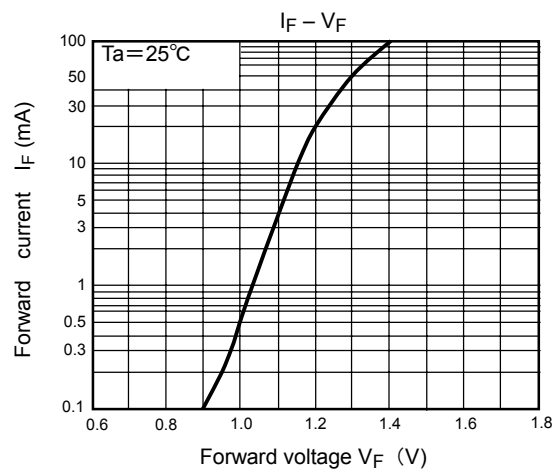
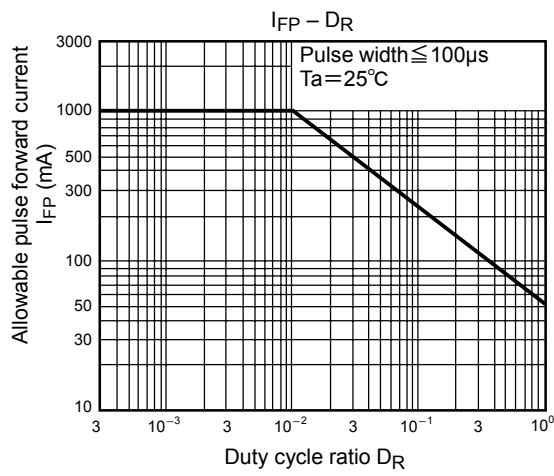
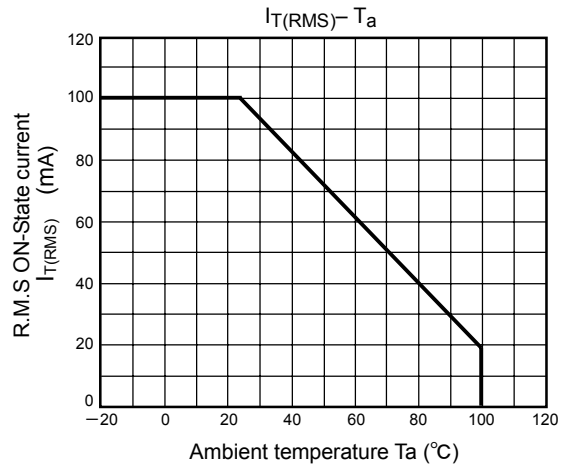
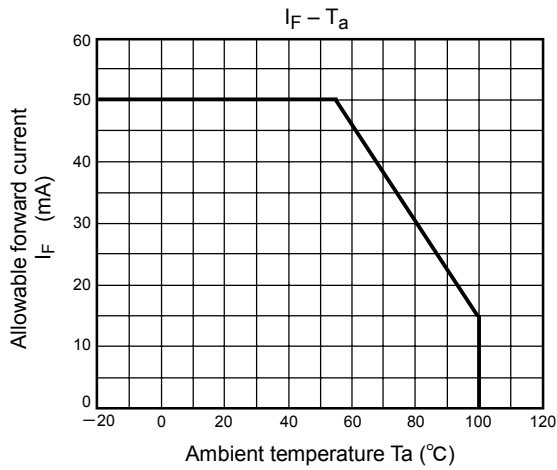
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM} = 600 \text{ V}$	—	10	1000	nA
	Peak on-state voltage	V_{TM}	$I_{TM} = 100 \text{ mA}$	—	1.7	3.0	V
	Holding current	I_H	—	—	1.0	—	mA
	Critical rate of rise of off-state voltage	dv/dt	$V_{in} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$ (Fig.1)	—	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt (c)$	$V_{in} = 60 \text{ Vrms}, I_T = 15\text{mA}$ (Fig.1)	—	0.2	—	$\text{V}/\mu\text{s}$

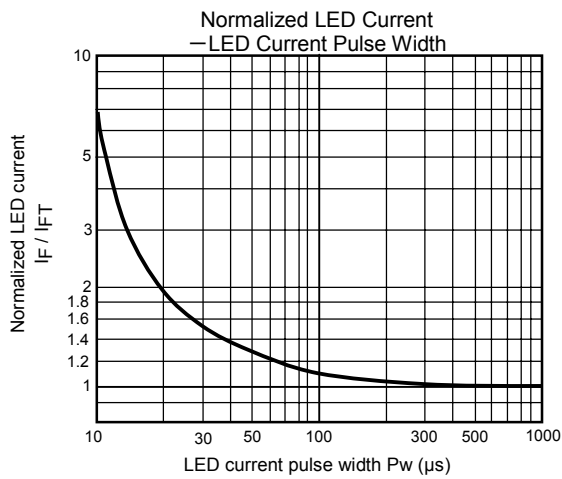
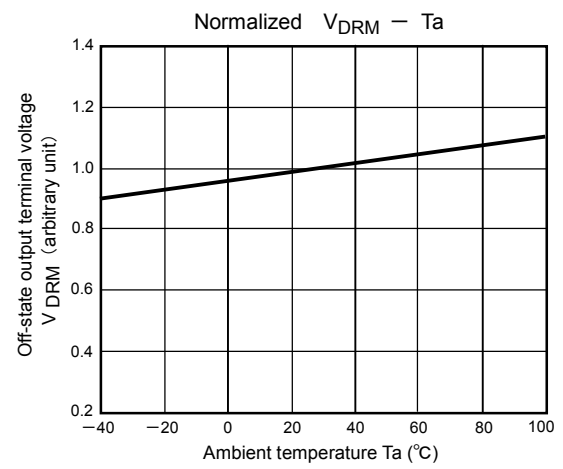
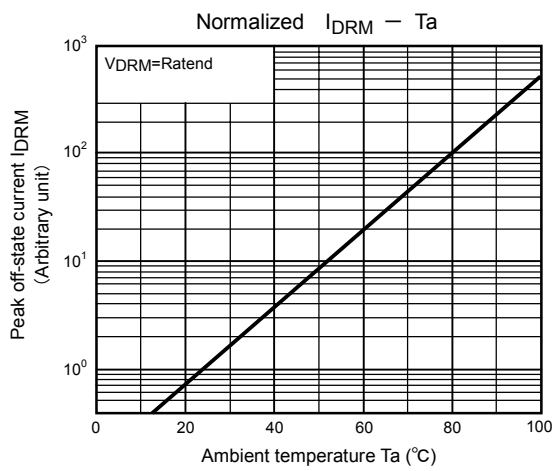
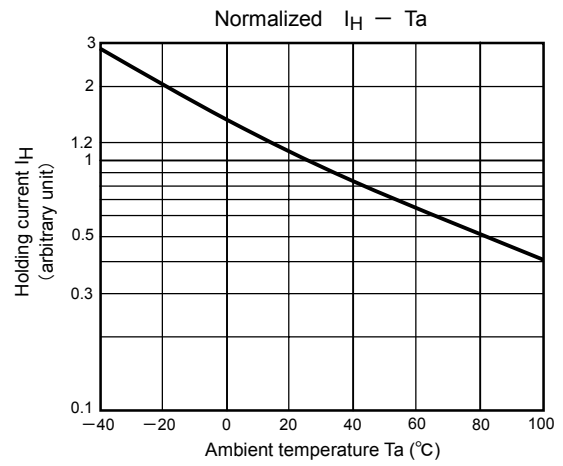
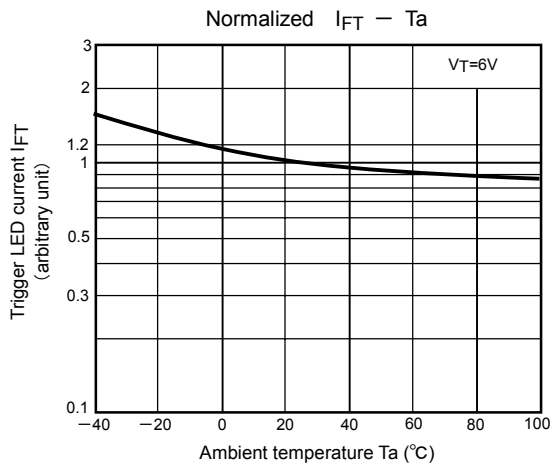
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	TLP3051	I_{FT}	$V_T = 6 \text{ V}$	—	—	15	mA
	TLP3052			—	5	10	
Capacitance input to output		C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance		R_S	$V_S = 500 \text{ V}, (R.H. \leq 60\%)$	5×10^{10}	10^{14}	—	Ω
Isolation voltage		BV_S	AC, 1 minute	5000	—	—	Vrms
			AC, 1 second, in oil	—	10000	—	
			DC, 1 minute, in oil	—	10000	—	V _{dc}

Fig. 1 dv/dt test circuit







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