TOSHIBA Photocoupler GaAs Ired & Photo−Triac

TLP3051,TLP3052

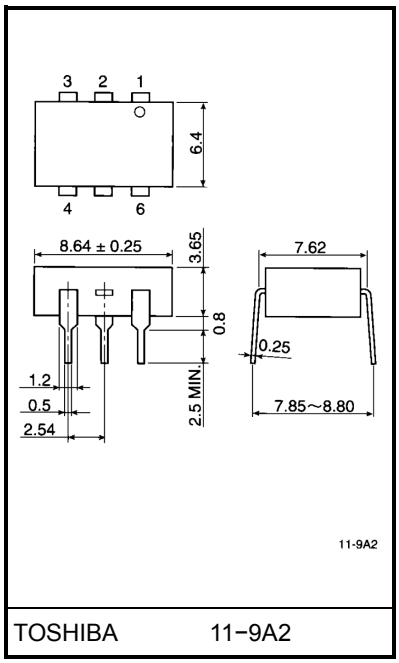
Office Machine

Household Use Equipment

Triac Driver

Solid State Relay

Unit in mm



TOSHIBA 11−9A2

Weight: 0.44 g

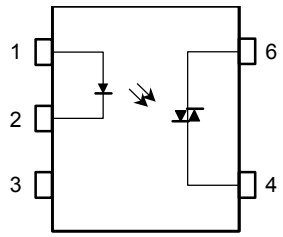
The TOSHIBA TLP3051 and TLP3052 consist of a photo−triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- 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 V_{PK}
  Highest permissible over voltage: 6000 V_{PK}

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

	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.)

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)		ΔI_F/°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)		ΔP_D/°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	$I_{T(RMS)}$	100	mA
		Ta = 70°C		50	
	On−state current derating (Ta ≥ 25°C)		ΔI_T/°C	−1.1	mA/°C
	Peak on−state current (100μs pulse, 120 pps)		I_{TP}	2	A
	Peak nonrepetitive surge current (P_W = 10 ms, DC = 10%)		I_{TSM}	1.2	A
	Power dissipation		P_D	300	mW
	Power dissipation derating (Ta ≥ 25°C)		ΔP_D/°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)			ΔP_T/°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

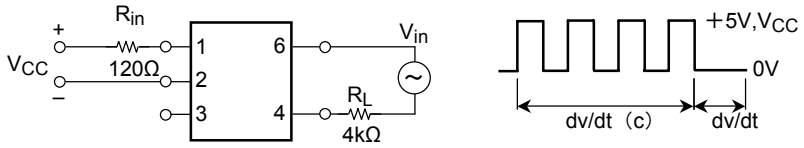
Individual Electrical Characteristics (Ta = 25°C)

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

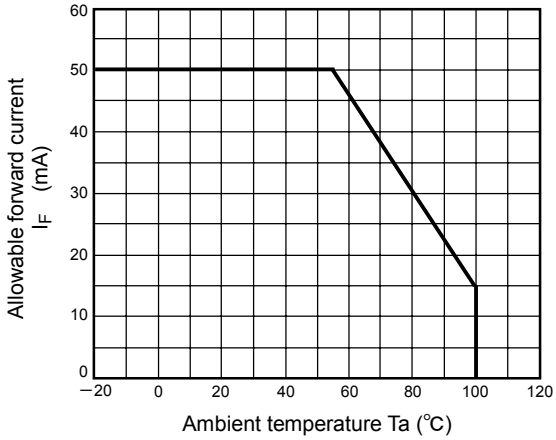
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	TLP3051	I_{FT}	V_T = 6 V	—	—	15	mA
	TLP3052			—	5	10	
Capacitance input to output		C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance		R_S	V_S = 500 V, (R.H.≤ 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}

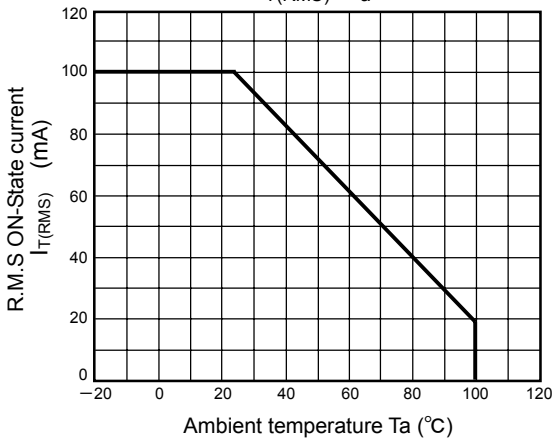
Fig. 1 dv/dt test circuit



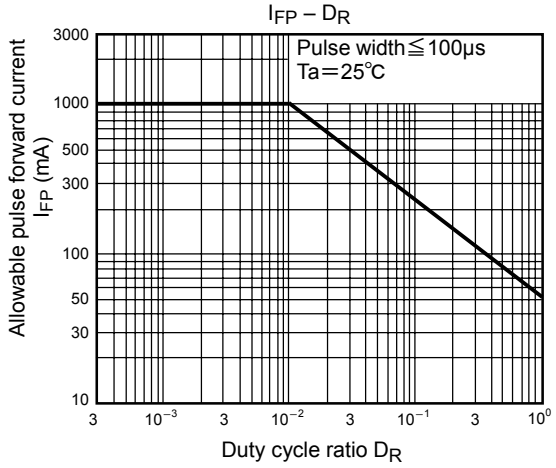
$I_F - T_a$



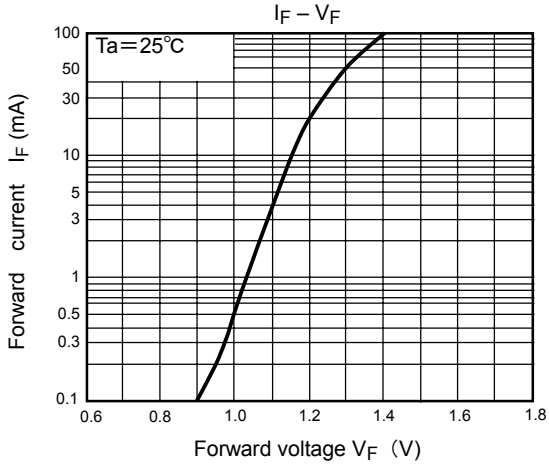
$I_{T(RMS)} - T_a$



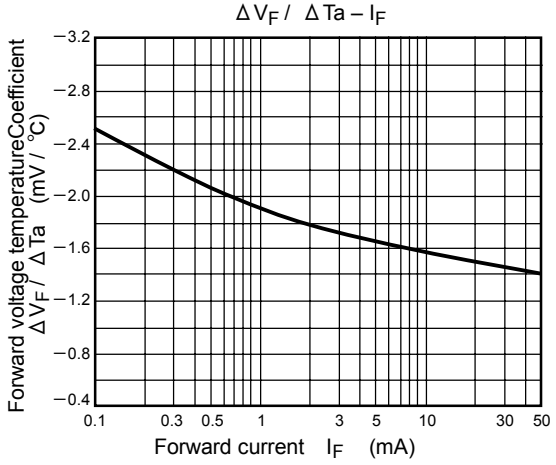
$I_{FP} - D_R$



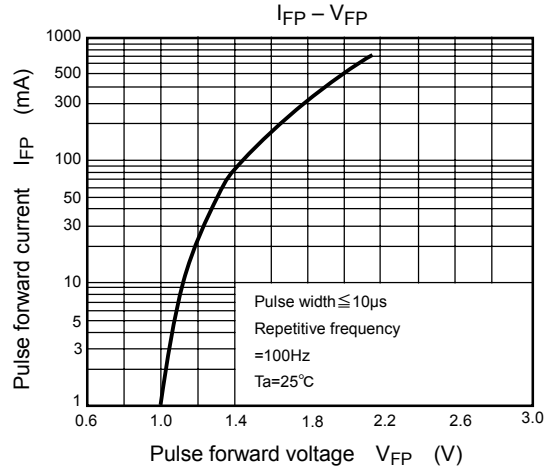
$I_F - V_F$



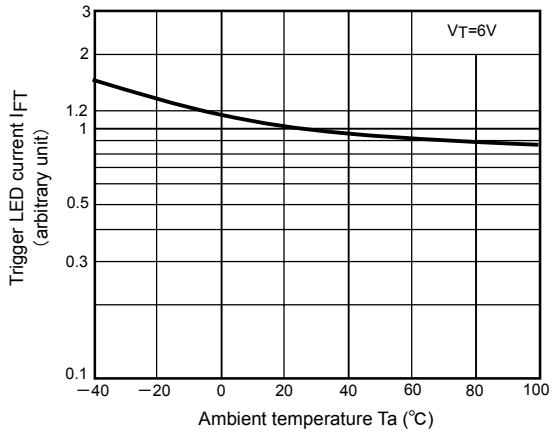
$\Delta V_F / \Delta Ta - I_F$



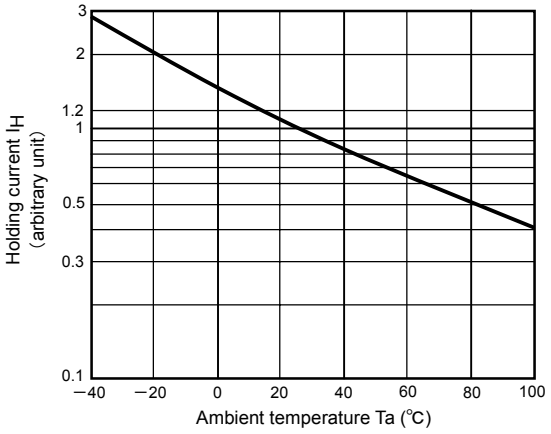
$I_{FP} - V_{FP}$



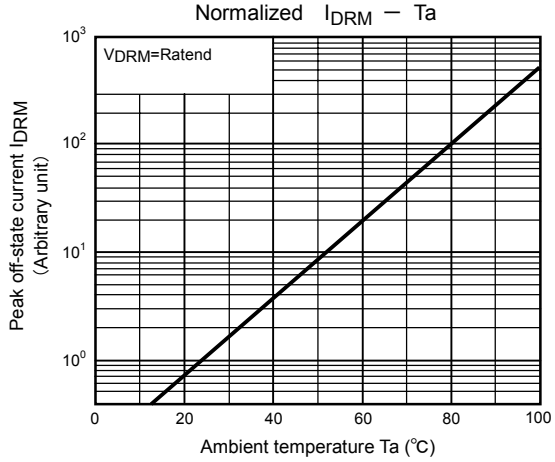
Normalized I_{FT} — Ta



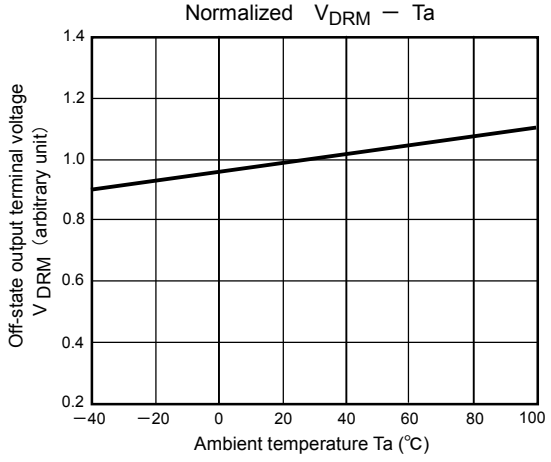
Normalized I_H — Ta



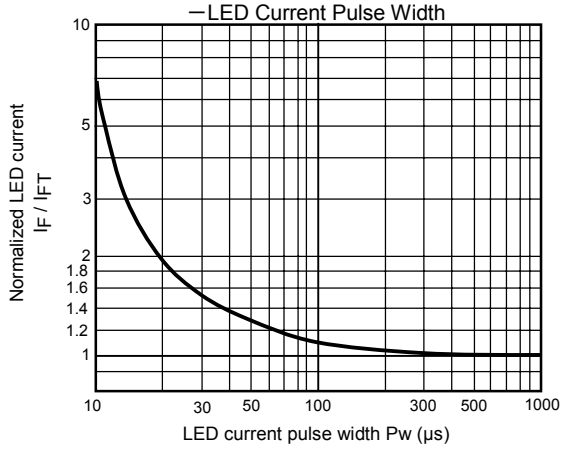
Normalized I_{DRM} — Ta



Normalized V_{DRM} — Ta



Normalized LED Current
—LED Current Pulse Width



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