

(TLP3041)

- OFFICE MACHINE
- HOUSEHOLD USE EQUIPMENT
- TRIAC DRIVER
- SOLID STATE RELAY

The TOSHIBA TLP3041, TLP3042 and TLP3043 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.

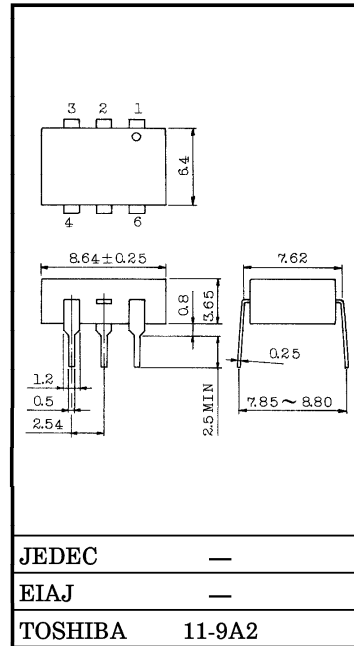
- Peak Off-State Voltage : 400V (Min.)
- Trigger LED Current : 15mA (Max.) (TLP3041)
 10mA (Max.) (TLP3042)
 5mA (Max.) (TLP3043)
- On-State Current : 100mA (Max.)
- UL Recognized : UL1577, File No. E67349
 Isolation Voltage : 5000Vrms (Min.)
- Option (D4) type
 VDE Approved : DIN VDE0884/08.87,
 Certificate No. 68329

Maximum Operating Insulation Voltage : 630V_{PK}
 Highest Permissible Over Voltage : 6000V_{PK}

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

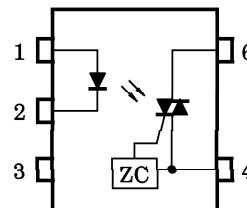
- | | <u>7.62mm pitch</u>
standard type | <u>10.16mm pitch</u>
(LF2) type |
|------------------------|--------------------------------------|------------------------------------|
| ● Creepage Distance : | 7.0mm (Min.) | 8.0mm (Min.) |
| Clearance : | 7.0mm (Min.) | 8.0mm (Min.) |
| Insulation Thickness : | 0.5mm (Min.) | 0.5mm (Min.) |

Unit in mm



Weight : 0.44g

PIN CONFIGURATION (TOP VIEW)



- 1 : ANODE
- 2 : CATHODE
- 3 : NC
- 4 : TERMINAL 1
- 6 : TERMINAL 2

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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 (100μs pulse, 100pps)	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}	400	V
	On-State RMS Current	Ta = 25°C	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, 120pps)	I _{TP}	2	A
	Peak Nonrepetitive Surge Current (P _w = 10ms, 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 (10s)	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 _G	5000	V _{rms}	

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

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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	$V = 0, f = 1\text{MHz}$	—	10	—	pF
DETECTOR	Peak Off-State Current	I_{DRM}	$V_{DRM} = 400\text{V}$	—	10	100	nA
	Peak On-State Voltage	V_{TM}	$I_{TM} = 100\text{mA}$	—	1.7	3.0	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{in} = 120\text{Vrms}, T_a = 85^\circ\text{C}$ (Fig.1)	200	500	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$V_{in} = 30\text{Vrms}, I_T = 15\text{mA}$ (Fig.1)	—	0.2	—	$\text{V}/\mu\text{s}$

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

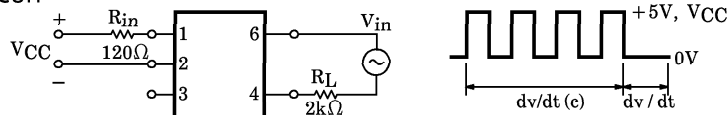
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	TLP3041	I_{FT}	$V_T = 3\text{V}$	—	—	15	mA
	TLP3042			—	5	10	
	TLP3043			—	—	5	
Inhibit Voltage	V_{IH}	$I_F = \text{Rated } I_{FT}$	—	—	40	V	
Leakage in Inhibited State	I_{IH}	$I_F = \text{Rated } I_{FT}$ $V_T = \text{Rated } V_{DRM}$	—	100	300	μA	
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	—	Vdc	

RECOMMENDED OPERATING CONDITIONS

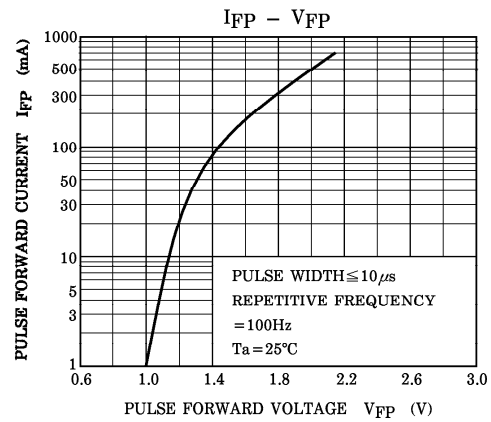
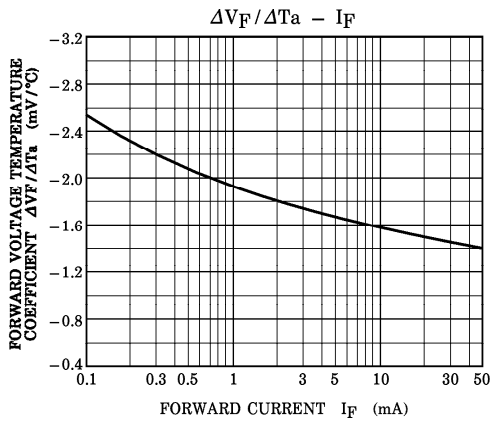
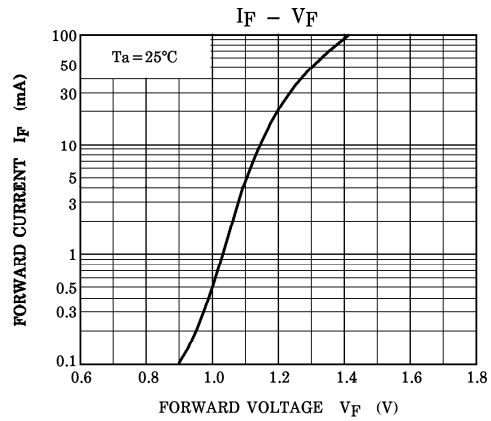
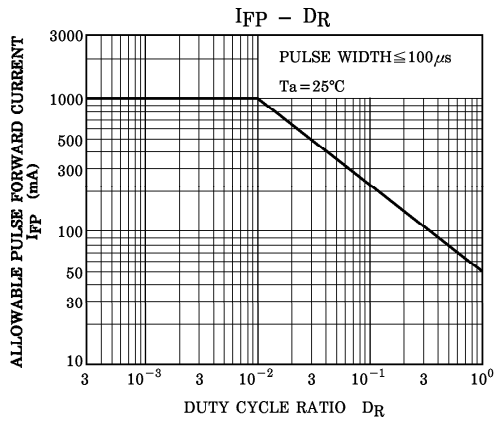
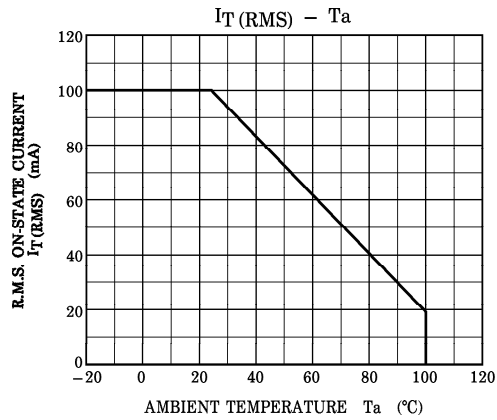
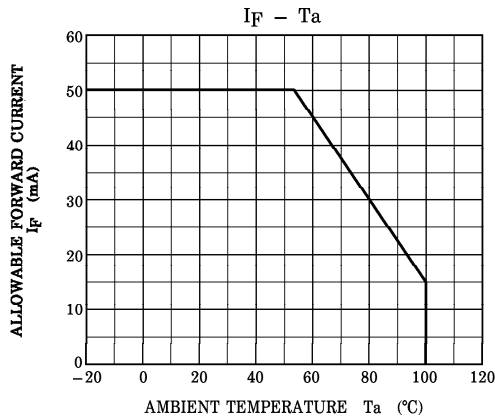
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{AC}	—	—	120	Vac
Forward Current	I_F^*	15	20	25	mA
Peak On-State Current	I_{TP}	—	—	1	A
Operating Temperature	T_{opr}	-25	—	85	$^\circ\text{C}$

※ In the case of TLP3042

Fig.1 dv/dt TEST CIRCUIT



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