

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP3041(S), TLP3042(S), TLP3043(S)

OFFICE MACHINE

HOUSEHOLD USE EQUIPMENT

TRIAC DRIVER

SOLID STATE RELAY

Unit in mm

The TOSHIBA TLP3041 (S), TLP3042 (S) and TLP3043 (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.

All parameters are tested to the specification of TLP3041, TLP3042, TLP3043.

- 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 : 5000V_{rms} (Min.)
- Option (D4) Type
- VDE Approved : DIN VDE0884 / 06.92
Certificate No. 68329

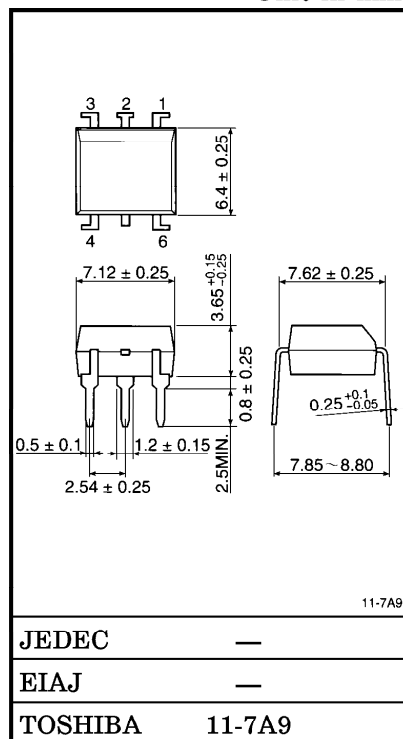
Maximum Operating Insulation Voltage : 890V_{PK}

Highest Permissible Over Voltage : 8000V_{PK}

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

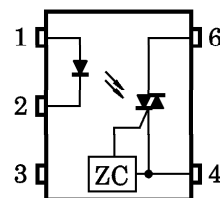
● Device Construction

	7.62mm pich standard type	10.16mm pich (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.)



Weight : 0.39g

PIN CONFIGURATION (Top view)



- 1 : ANODE
- 2 : CATHODE
- 3 : N.C.
- 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)	$\Delta I_F / ^\circ\text{C}$	-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)	$\Delta P_D / ^\circ\text{C}$	-1.0	mW / °C
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage	V_{DRM}	400	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 (100µs pulse, 120pps)	I_{TP}	2	A
	Peak Nonrepetitive Surge Current (Pw = 10ms, 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 (10s)	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}	—	—	120	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 TLP3042

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	$V_S = 500\text{V} (\text{R.H.} \leq 60\%)$	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

Fig.1 dv/dt TEST CIRCUIT

