TOSHIBA

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

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

OFFICE MACHINE HOUSEHOLD USE EQUIPMENT TRIAC DRIVER SOLID STATE RELAY

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

- Peak Off-State Voltage : 400 V (min)
- **Trigger LED Current**
- : 15 mA (max) (TLP3041(S)) 10 mA (max) (TLP3042(S))
- **On-State Current**
- 5 mA (max) (TLP3043(S)) : 100 mA (max)

: SS EN60065

- Isolation Voltage : 5000 Vrms (min)
- UL Recognized : UL1577, File No. E67349
- SEMKO Approved
- **BSI** Approved
- : BS EN60065, File No.8385 BS EN60950, File No.8386

SS EN60950, File No.9841109

Option (D4) type

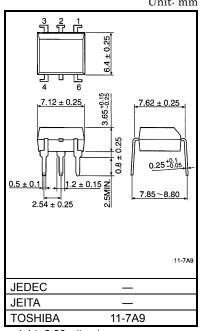
VDE approved: DIN EN60747-5-2 Approved No. 40009302

Maximum operating insulation voltage: 890VPK Highest permissible over voltage: 8000VPK

(Note): When a EN60747-5-2 approved type is needed, please designate the "Option (D4)"

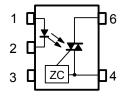
Construction mechanical rating

	7.62 mm pich Standard Type	10.16 mm pich 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)		



weight: 0.39g (typ.)

Pin Configuration (top view)



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

ZC:Zero-cross Circuit

Absolute Maximum Ratings (Ta = 25°C)

	CHARACTERIST	IC	SYMBOL	RATING	UNIT	
	Forward Current		lF	50	mA	
0	Forward Current Derat (Ta ≥ 53°C)	ng	ΔI _F / °C	-0.7	mA / °C	
	Peak Forward Current (100 <i>µ</i> s pulse, 100pps)		IFP	1	А	
LED	Power Dissipation		PD	100	mW	
	Power Dissipation Derating (Ta ≥ 25°C)		ΔP _D / °C	-1.0	mW / °C	
	Reverse Voltage		V _R	5	V	
	Junction Temperature		Тј	125	°C	
	Off-State Output Termi	nal Voltage	V _{DRM}	400	V	
	On-Stage RMS	Ta = 25°C		100	m۸	
DETECTOR	Current	Ta = 70°C	I _{T(RMS)}	50	mA	
	On-State Current Derating (Ta ≥ 25°C)		ΔI _T / °C	-1.1	mA / °C	
	Peak On-Stage Curren (100 µs pulse, 120 pps)	t	ITP	2	А	
	Peak Nonrepetitive Sur Current (P _W = 10ms)	ge	ITSM	1.2	А	
	Power Dissipation		PD	300	mW	
	Power Dissipation Derating (Ta ≥ 25°C)		ΔP _D / °C	-4.0	mW / °C	
	Junction Temperature		Tj	115	°C	
Stora	age Temperature Range		T _{stg}	-55 to 150	°C	
Operating Temperature Range			T _{opr}	-40 to 100	°C	
Lead Soldering Temperature (10s)			T _{sol}	260	°C	
Total Package Power Dissipation			Ρ _T	330	mW	
Total Package Power Dissipation Derating (Ta ≥ 25°C)			ΔP _T / °C	-4.4	mW / °C	
	tion Voltage 1 min., R.H. ≤ 60%)	BVS	5000	Vrms		

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 _{AC}			120	Vac
Forward Current	I _F *	15	20	25	mA
Peak On-Stage Current	I _{TP}			1	Α
Operating Temperature	T _{opr}	-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 TLP3042

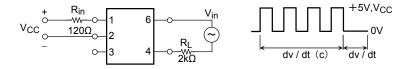
Individual Electrical Characteristics (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
	Forward Voltage	V _F	I _F = 10mA	1.0	1.15	1.3	V
LED	Reverse Current	I _R	V _R = 5V	_		10	μA
	Capacitance	CT	V = 0, f = 1MHz	_	10	_	pF
	Peak Off-State Current	IDRM	V _{DRM} = 400V	_	10	100	nA
с	Peak On-Stage Voltage	V _{TM}	I _{TM} = 100mA	_	1.7	3.0	V
CTO	Holding Current	Ι _Η	—	_	0.6	_	mA
DETECTOR	Critical Rate of Rise of Off- State Voltage	dv / dt	V _{in} = 120Vrms, Ta = 85°C (Fig.1)	200	500	_	V / μs
	Critical Rate of Rise of Commutating Voltage	dv / dt(c)	V _{in} = 30Vrms, IT = 15mA (Fig.1)		0.2	_	V / μs

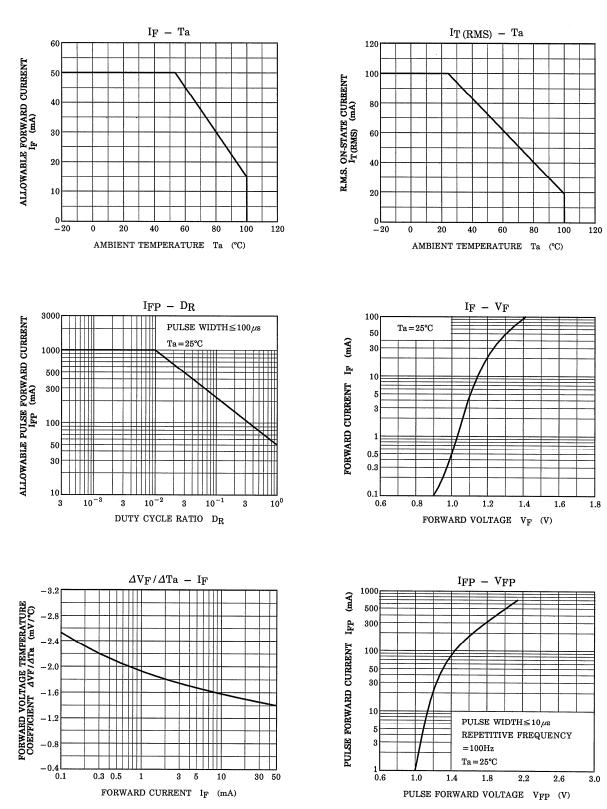
Coupled Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Trigger LED Current	TLP3041(S)	IFT	V _T = 3V	_	_	15	mA	
	TLP3042(S)				5	10		
	TLP3043(S)				_	5		
Inhibit Voltage		VIH	I _F = Rated I _{FT}		_	40	0 V	
Leakage in Inhibited State		IIН	I _F = Rated I _{FT} V _T = Rated V _{DRM}	_	100	300	μA	
Capacitance Input to Out	put	CS	V _S = 0, f = 1MHz		0.8		— pF	
Isolation Resistance	plation Resistance		V _S = 500V (R.H. ≤ 60%)	5×10 ¹⁰	10 ¹⁴		Ω	
Isolation Voltage		BVS	AC, 1 minute	5000	_	_	Vrma	
			AC, 1 second (in oil)		10000		Vrms	
			DC, 1 minute (in oil)		10000		Vdc	

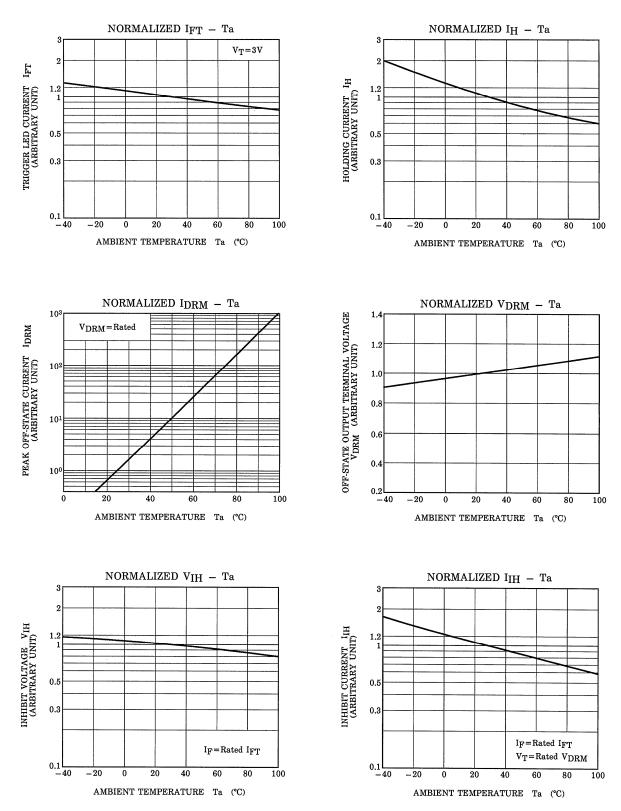
Fig. 1 dv / dt test circuit



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