

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

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

Unit: mm

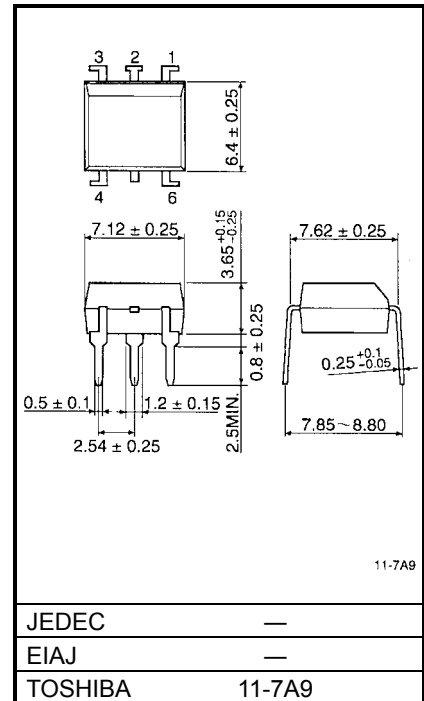
OFFICE MACHINE
HOUSEHOLD USE EQUIPMENT
TRIAC DRIVER
SOLID STATE RELAY

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))
5 mA (max) (TLP3043(S))
- On-State Current : 100 mA (max)
- Isolation Voltage : 5000 Vrms (min)
- UL Recognized : UL1577, File No. E67349
- SEMKO Approved : SS EN60065
SS EN60950, File No.9841109
- BSI Approved : BS EN60065, File No.8385
BS EN60950, File No.8386
- Option (D4) type
VDE approved: DIN EN60747-5-2
Approved No. 40009302
Maximum operating insulation voltage: 890V_{PK}
Highest permissible over voltage: 8000V_{PK}
(Note):When a EN60747-5-2 approved type is needed,
please designate the "Option (D4)"

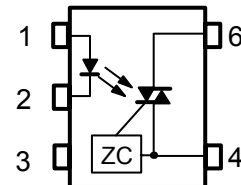
● Construction mechanical rating

	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

Pin Configuration (top view)



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

ZC:Zero-cross Circuit

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-Stage RMS	Ta = 25°C	I _{T(RMS)}	100	mA
	Current	Ta = 70°C		50	
	On-State Current Derating (Ta ≥ 25°C)		ΔI _T / °C	−1.1	mA / °C
	Peak On-Stage 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
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 _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-Stage Current	I_{TP}	—	—	1	A
Operating Temperature	T_{opr}	-25	—	85	°C

* : In the case of TLP3042

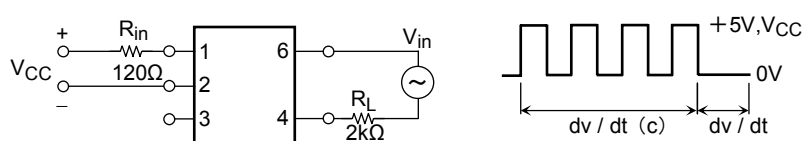
INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

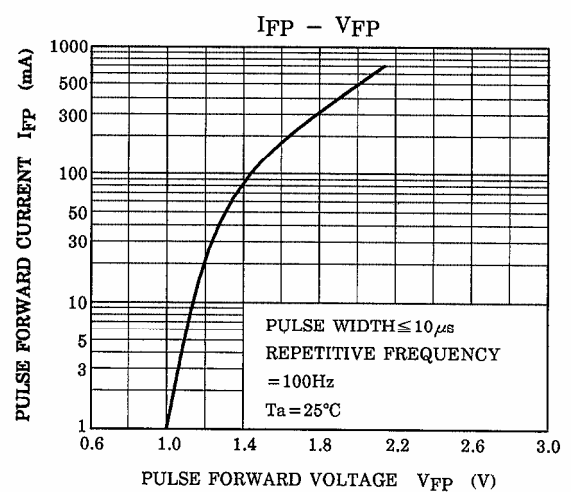
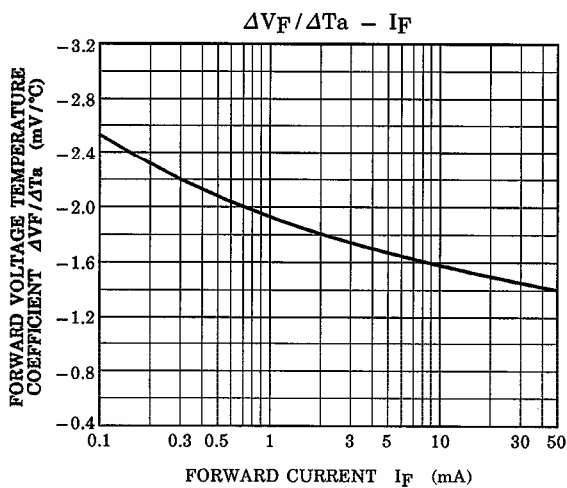
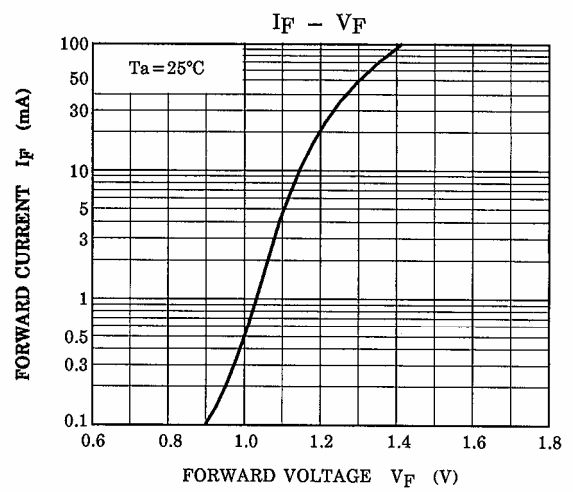
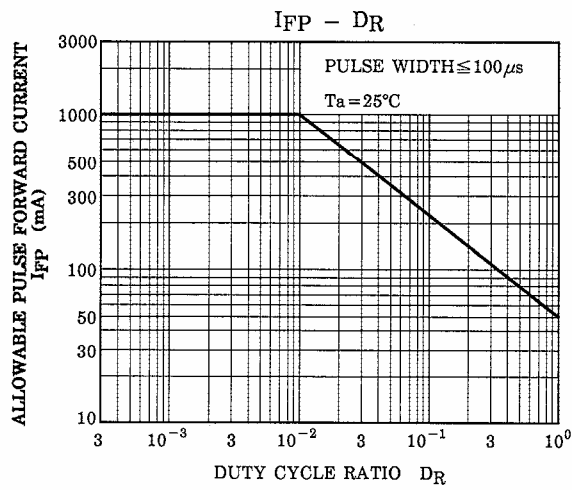
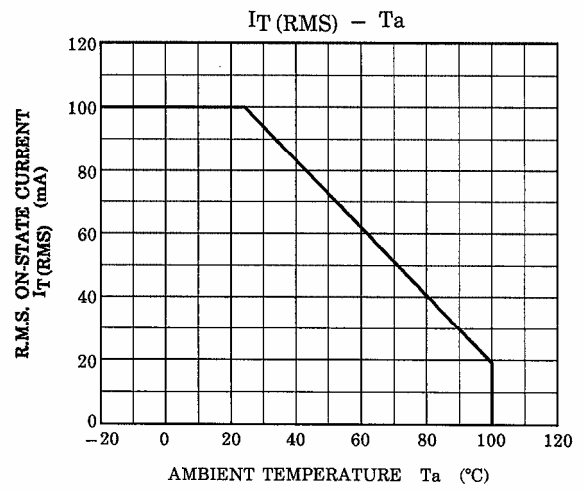
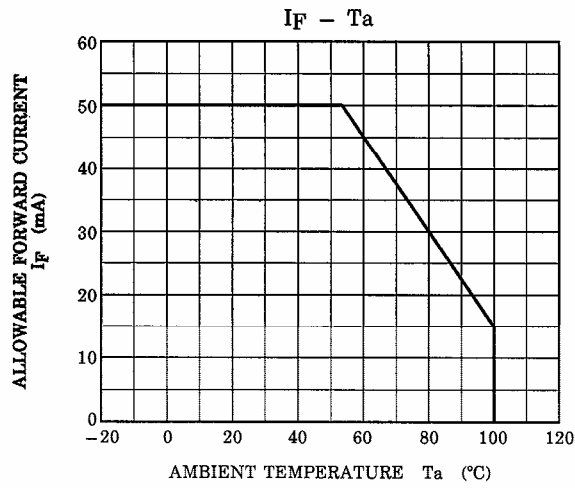
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	10	—	pF
DETECTOR	Peak Off-State Current	I_{DRM}	$V_{\text{DRM}} = 400\text{V}$	—	10	100	nA
	Peak On-Stage Voltage	V_{TM}	$I_{\text{TM}} = 100\text{mA}$	—	1.7	3.0	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv / dt	$V_{\text{in}} = 120\text{Vrms}, T_a = 85^\circ\text{C}$ (Fig.1)	200	500	—	V / μs
	Critical Rate of Rise of Commutating Voltage	$dv / dt(c)$	$V_{\text{in}} = 30\text{Vrms}, I_T = 15\text{mA}$ (Fig.1)	—	0.2	—	V / μs

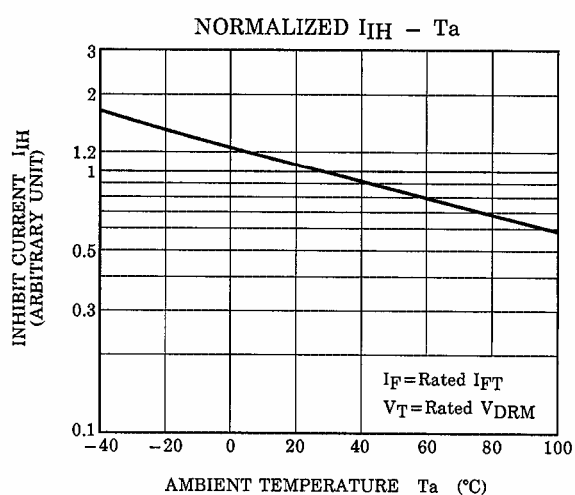
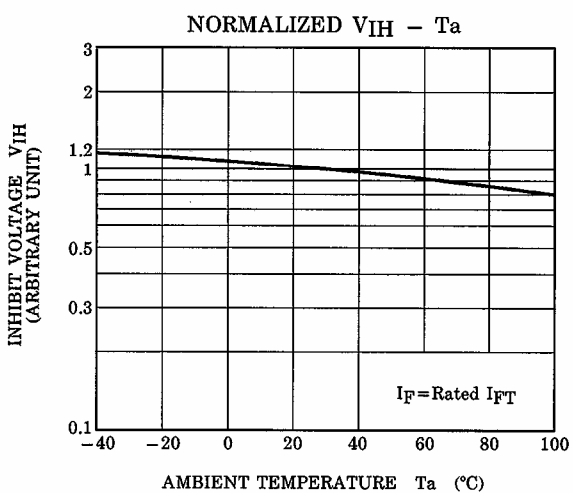
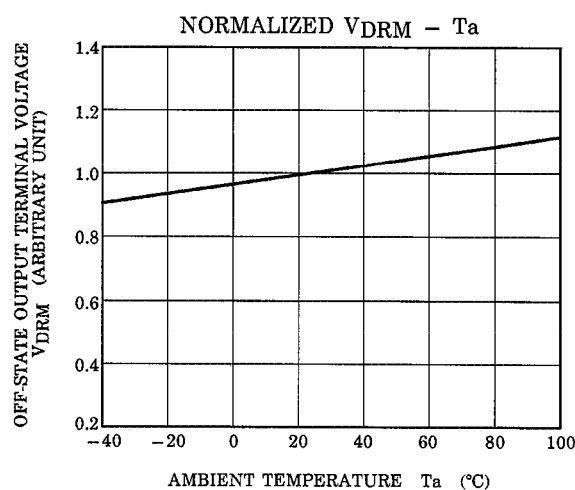
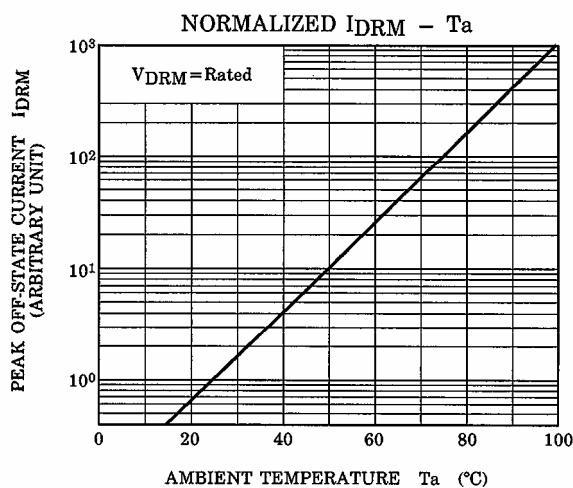
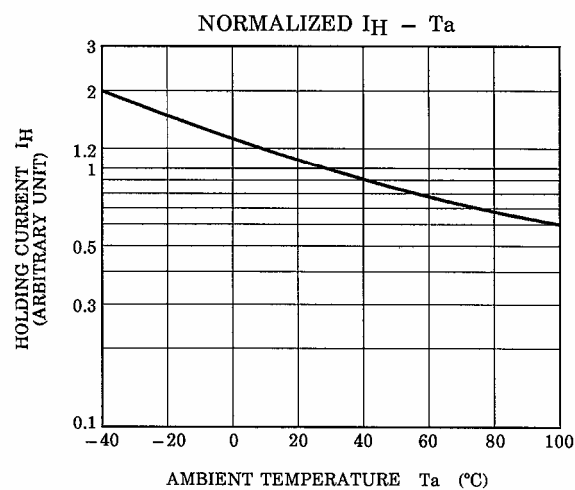
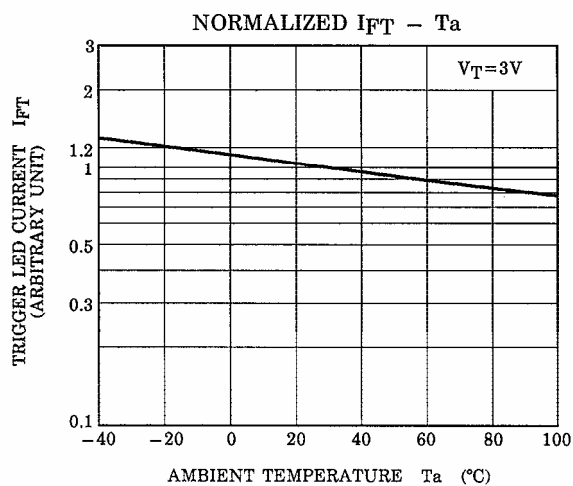
COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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

Fig. 1 dv / dt test circuit







RESTRICTIONS ON PRODUCT USE

030619EBC

- The information contained herein is subject to change without notice.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- TOSHIBA products should not be embedded to the downstream products which are prohibited to be produced and sold, under any law and regulations.
- GaAs(Gallium Arsenide) is used in this product. The dust or vapor is harmful to the human body. Do not break, cut, crush or dissolve chemically.