TOSHIBA Photocoupler GaAs Ired & Photo-Triac

TLP360J

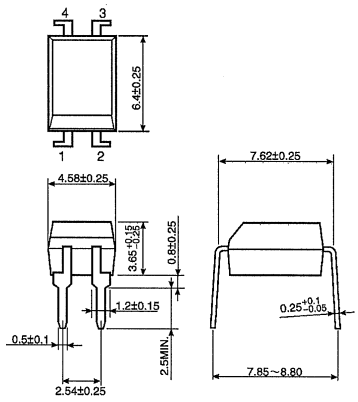
Triac Drivers

Programmable Controllers

AC-Output Modules

Solid State Relays

Unit: mm



JEDEC	
TOSHIBA	11-5B2

Weight: 0.26 g (typ.)

TOSHIBA TLP360J consists of a photo-triac optically coupled to a gallium arsenide infrared-emitting diode in a four-lead plastic DIP package.

- Peak off-state voltage: 600 V (Min.)
- Trigger LED current: 10 mA (Max.)
- On-state current: 100 mA (Max.)
- Isolation voltage: 5000 Vrms (Max.)
- UL recognized: UL1577, file No. E67349
- Option (D4) type

TÜV approved: DIN EN60747-5-2

Certificate No. R50033433

Maximum operating insulation voltage : 890 Vpk

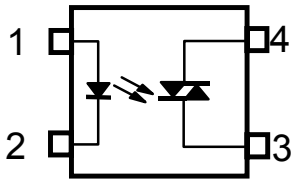
Maximum permissible overvoltage : 8000 Vpk

(Note) When an EN60747-5-2 approved type is needed, please designate "Option (D4)."

- Construction mechanical rating

	7.62 mm pitch standard type	10.16 mm pitch TLPXXXF type
Creepage distance	7.0 mm (min)	8.0 mm (min)
Clearance	7.0 mm (min)	8.0 mm (min)
Insulation thickness	0.4 mm (min)	0.4 mm (min)

Pin Configuration (top view)



1: Anode
2: Cathode
3: Terminal1
4: Terminal2

•Trigger LED Current

Classi–fication*	Trigger LED current (mA) V_T = 6 V, Ta = 25°C		Marking of classification
	Min.	Max.	
(IFT7)	—	7	T7
Standard	—	10	T7, blank

*Example: "(IFT7)"; "TLP360J(IFT7)"

(Note) When specifying the application type name for certification testing, be sure to use the standard product type name, e.g., TLP360J(IFT7): TLP360J.

Absolute 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
	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 (100 μs pulse, 120 pps)		I_{TP}	2	A
	Peak nonrepetitive surge current (Pw = 10 ms, DC = 10%)		I_{TSM}	1.2	A
	Junction temperature		T_j	115	°C
Storage temperature range			T_{stg}	−55~125	°C
Operating temperature range			T_{opr}	−40~100	°C
Lead soldering temperature (10 s)			T_{sol}	260	°C
Isolation voltage (AC, 1 min., R.H.≤ 60%) (Note 1)			BV_S	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: Pins 1 and 2 are shorted together and pins 3 and 4 are shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	240	V_{ac}
Forward current	I_F	15	20	25	mA
Peak on-state current	I_{TP}	—	—	1	A
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.

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	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv/dt	Vin = 240 Vrms , Ta = 85°C (Note 2)	—	500	—	V/μs
	Critical rate of rise of commutating voltage	dv/dt(c)	Vin = 60 Vrms , I_T = 15 mA (Note 2)	—	0.2	—	V/μs

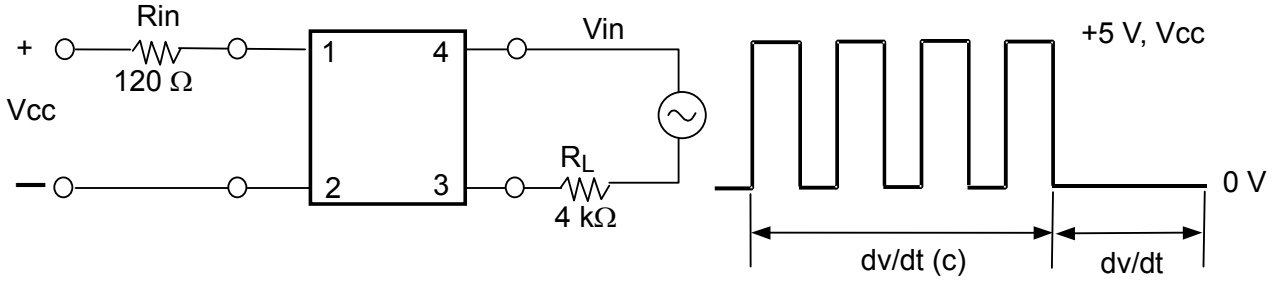
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T = 6 V	—	—	10	mA
Turn-on time	t_{ON}	V_D = 6 → 4 V , R_L = 100 Ω I_F = Rated I_{FT}X1.5	—	30	100	μs

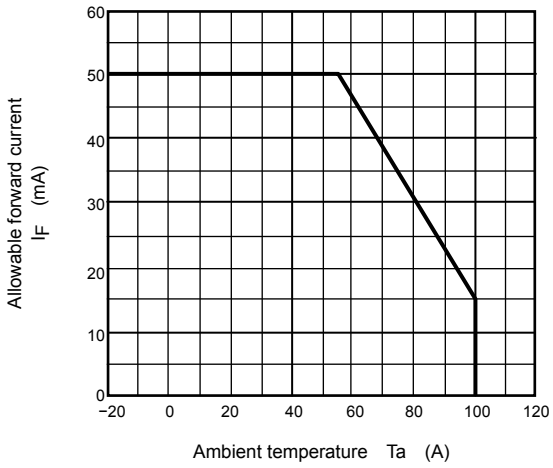
Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
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%	1×10^{12}	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

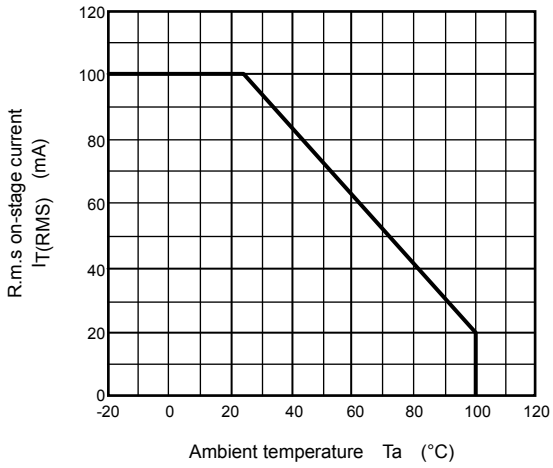
(Note 2): dv/dt test circuit



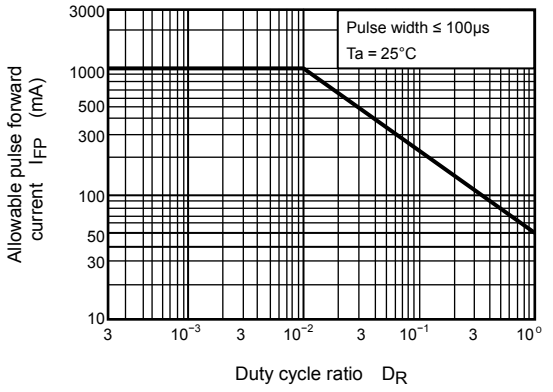
I_F – Ta



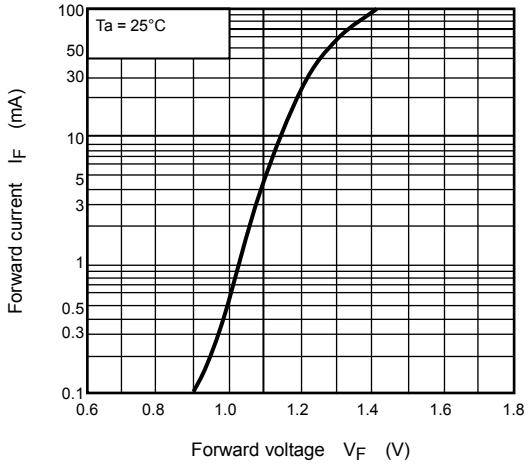
$I_{T(RMS)}$ – Ta



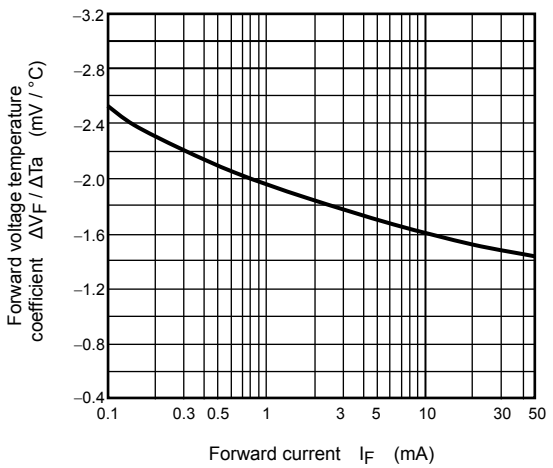
I_{FP} – D_R



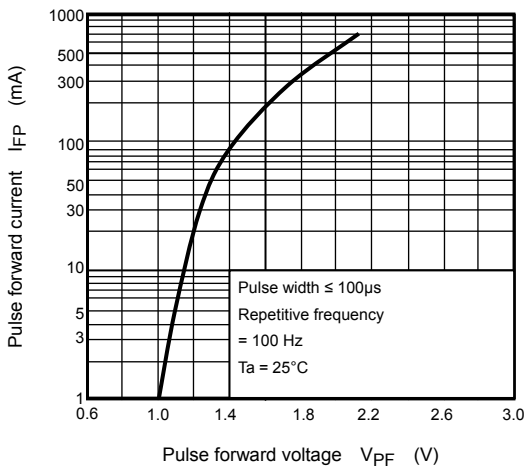
I_F – V_F



$\Delta V_F / \Delta Ta$ – I_F

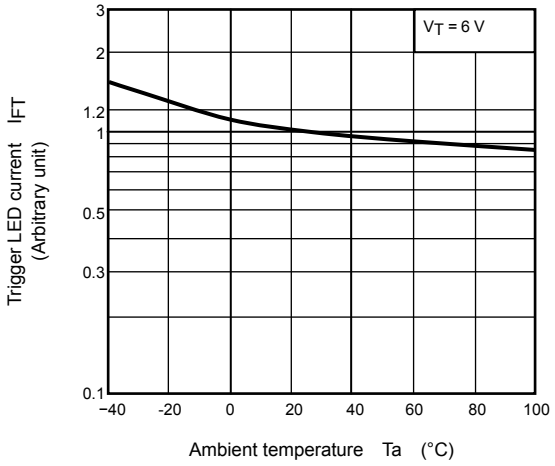


I_{FP} – V_{FP}

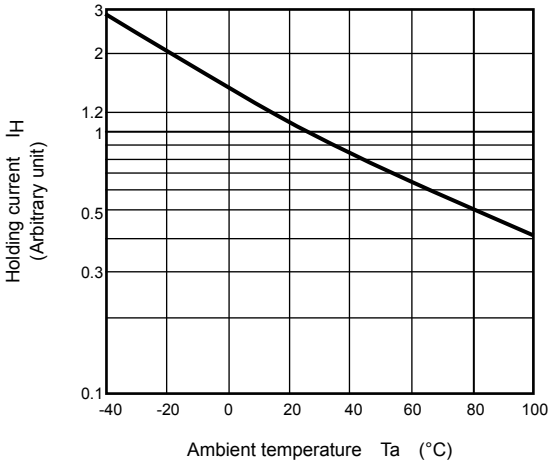


*: The above graphs show typical characteristics.

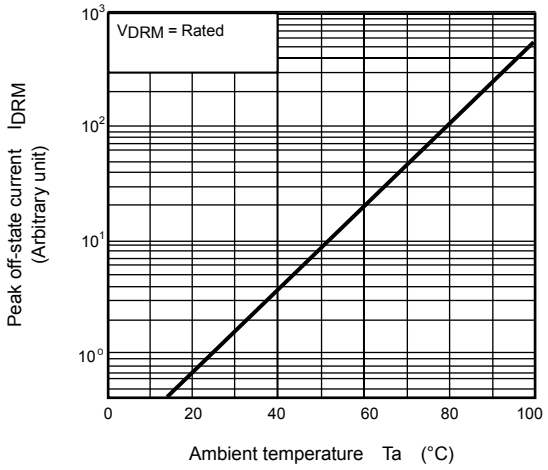
Normalized I_{FT} – Ta



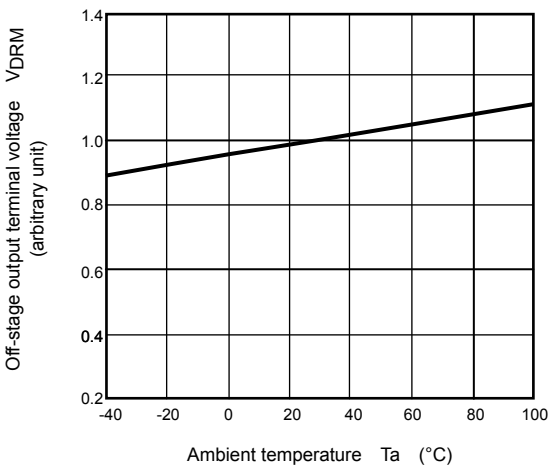
Normalized I_H – Ta



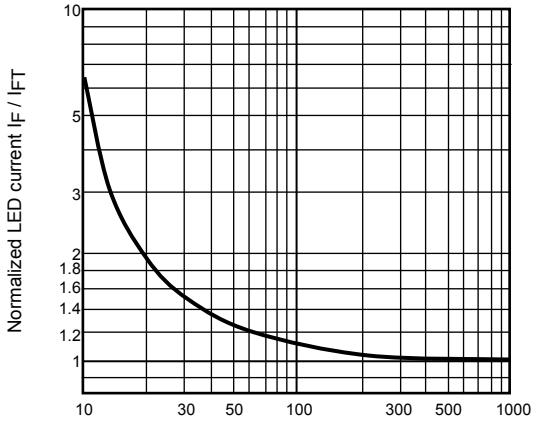
Normalized I_{DRM} – Ta



Normalized V_{DRM} – Ta



Normalized I_F / I_{FT} – P_W



*: The above graphs show typical characteristics.

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