

TOSHIBA PHOTOCOUPLER IRED & PHOTO-TRIAC

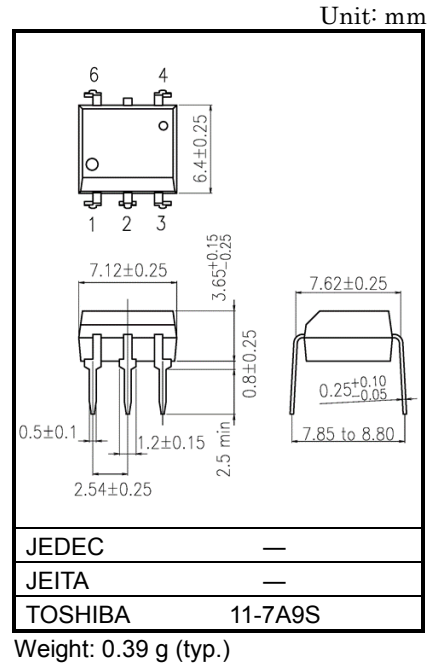
TLP3762(S)

Office Equipment
Home Appliances
Triac Drivers
Solid State Relays

The TLP3762(S) DIP consists of a triac-output photocoupler featuring a zero-cross voltage optically coupled to an infrared emitting diode and is housed in a 6-pin package.

The TLP3762(S), offers higher impulse noise immunity than that of the TLP3062(S).

- Peak Off-State Voltage :600 V (min)
- Trigger LED Current :10 mA (max)
- On-State Current :100 mA (max)
- Isolation Voltage :5000 Vrms (min)
- UL-recognized : UL 1577, File No.E67349
- cUL-recognized : CSA Component Acceptance Service No.5A File No.E67349
- VDE-approved : EN 60747-5-5 , EN 62368-1 (Note1)

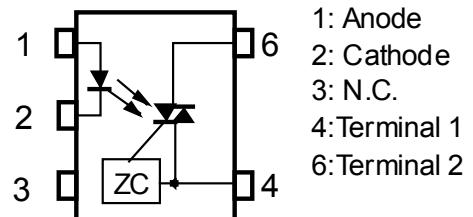


Note 1 : When a VDE approved type is needed,
please designate the **Option(D4)**.

- Construction mechanical rating

	7.62 mm pitch Standard Type	10.16 mm pitch TLPxxxxF 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)



ZC: Zero-cross Circuit

Start of commercial production
2009-03

Absolute 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 (100 μs pulse, 100 pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P_D	100	mW
	Power dissipation derating (Ta ≥ 53°C)	$\Delta P_D / ^\circ\text{C}$	-1.4	mW / °C
	Junction temperature	T_j	125	°C
Detector	Off-state output terminal voltage	V_{DRM}	600	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 (100 μs pulse, 120 pps)	I_{TP}	2	A
	Peak nonrepetitive surge current (Pw = 10 ms)	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
Operating temperature range	T_{opr}	-40 to 100	°C	
Storage temperature range	T_{stg}	-55 to 125	°C	
Lead soldering temperature (10 s)	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, 60 s., 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: The devices are considered two-terminal devices: pins 1,2 and 3 are shorted together, as are pins 4 and 6.

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{AC}	—	—	240	Vac
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 devices. Each item also has its own independent guideline document. In developing designs using this product, please confirm the specified characteristics shown in these documents.

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 V, 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	V _{in} = 240 Vrms, Ta = 85 °C (Note 2)	200	500	—	V/μs
	Critical rate of rise of commutating voltage	dv/dt(c)	V _{in} = 60 Vrms, I _T = 15 mA (Note 2)	—	0.2	—	V/μs

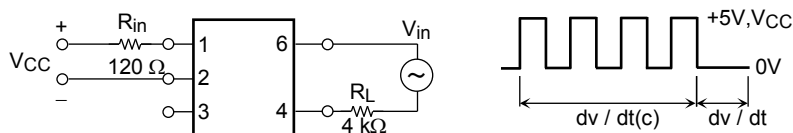
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I _{FT}	V _T = 3 V	—	—	10	mA
Inhibit voltage	V _{IH}	I _F = Rated I _{FT}	—	—	20	V
Leakage in inhibited state	I _{IH}	I _F = Rated I _{FT} , V _T = Rated V _{DRM}	—	200	600	μA
Turn-on time	t _{ON}	V _D = 3 → 1.5 V, R _L = 20 Ω, I _F = Rated I _{FT} × 1.5	—	30	100	μs
Impulse noise durability	V _N	t _N = 1 μs, snubber condition 120 Ω + 0.1 μF (Note 3)	—	2000	—	V

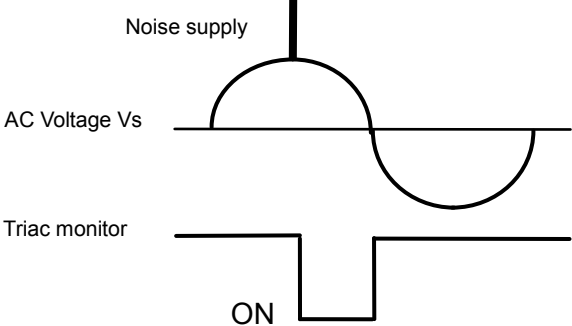
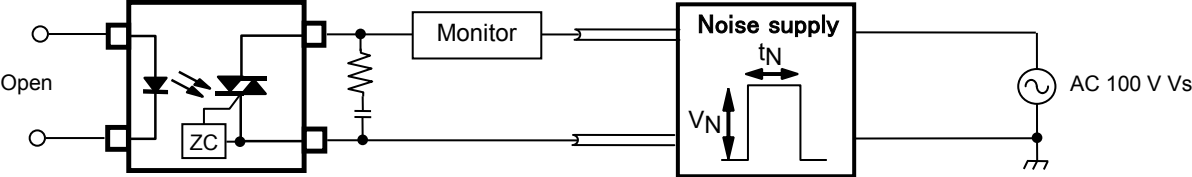
Isolation Characteristics (Ta = 25°C)

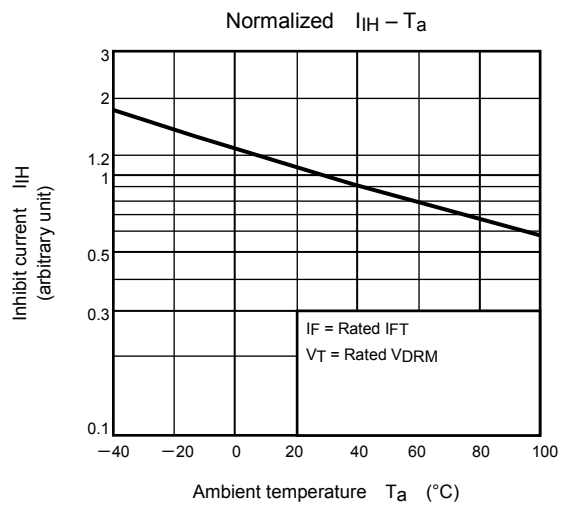
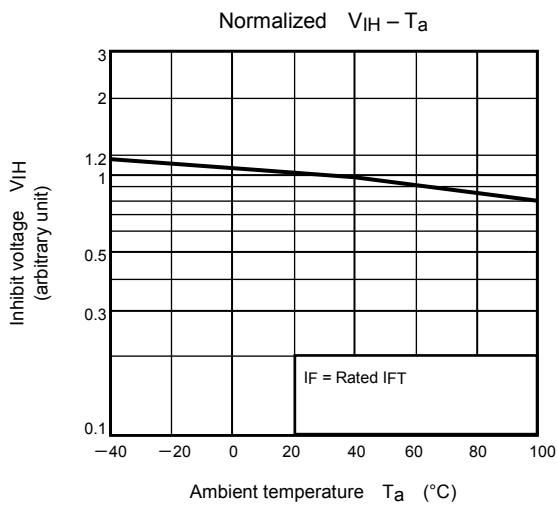
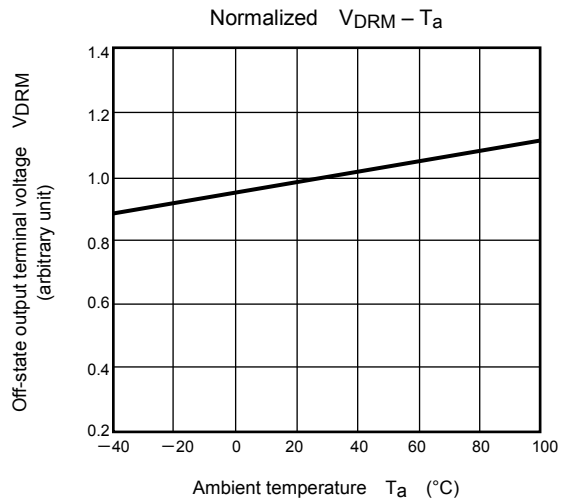
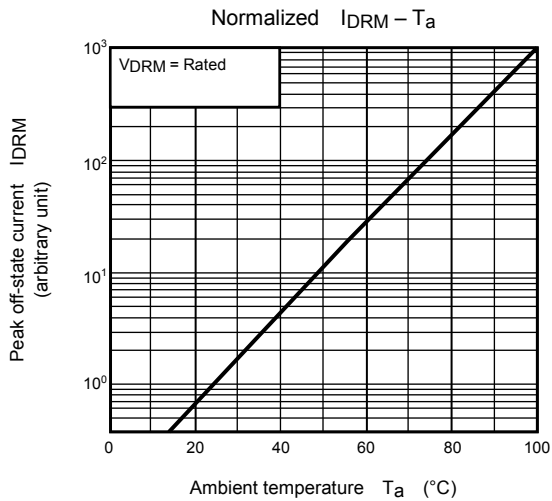
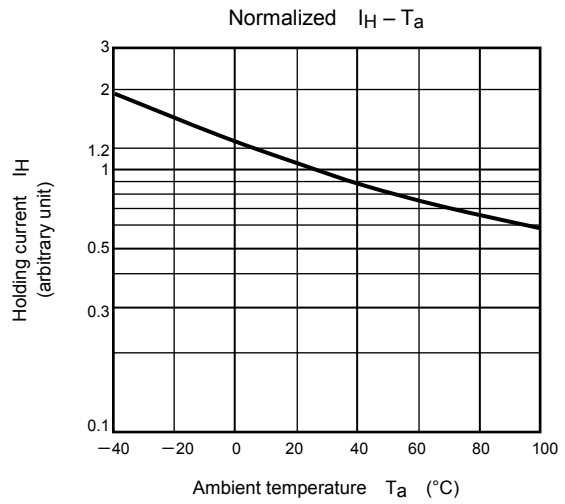
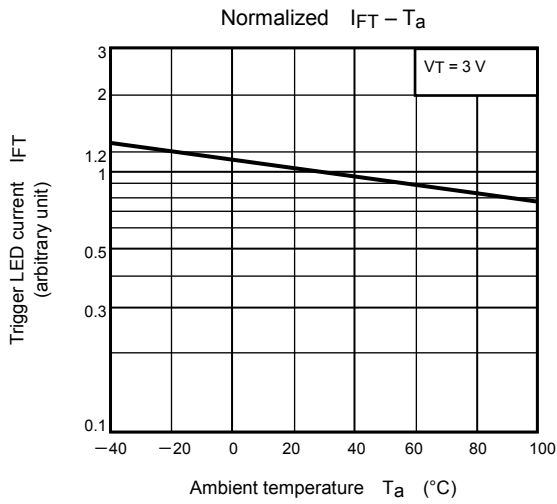
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance (input to output)	C _S	V _S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R _S	V _S = 500 V (R.H. ≤ 60 %)	1 × 10 ¹²	10 ¹⁴	—	Ω
Isolation voltage	BV _S	AC, 60 s	5000	—	—	Vrms

Note 2: dv / dt test circuit

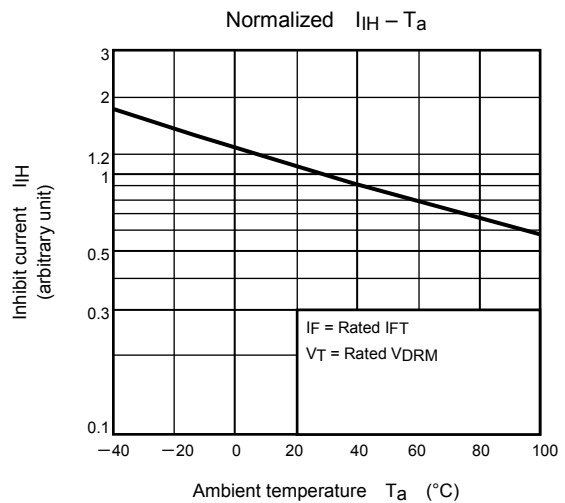
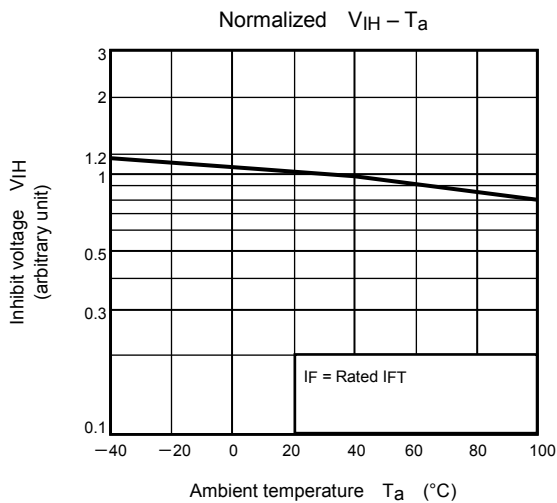
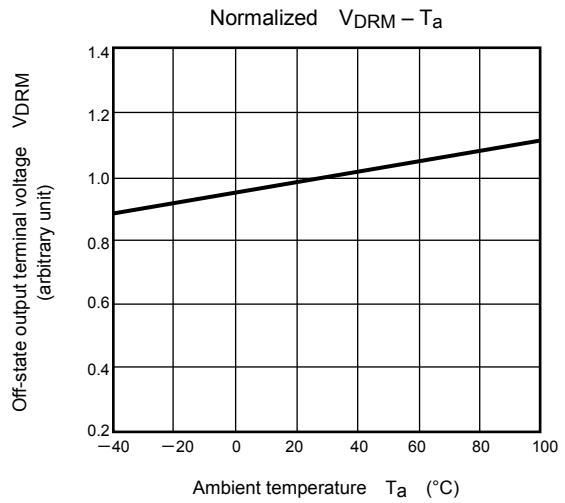
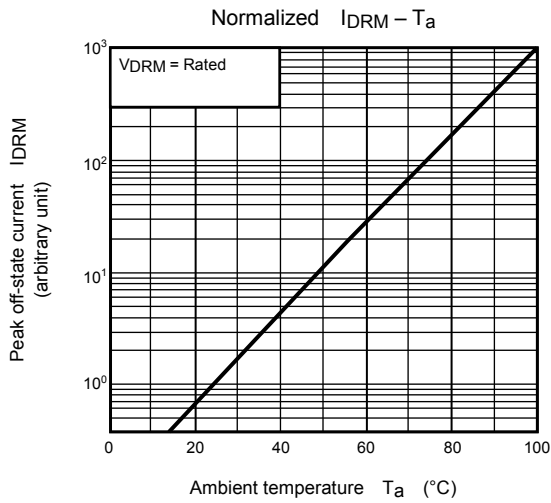
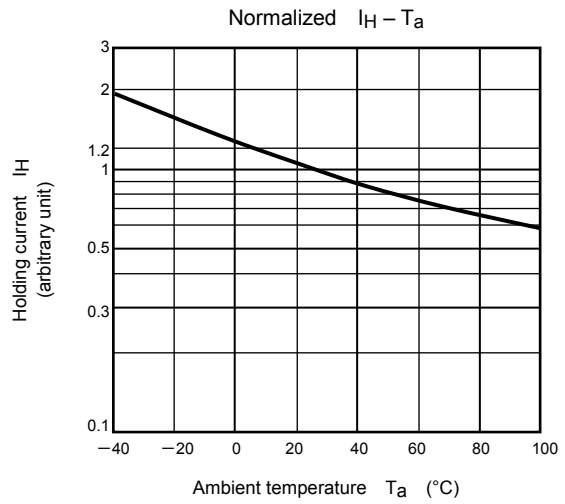
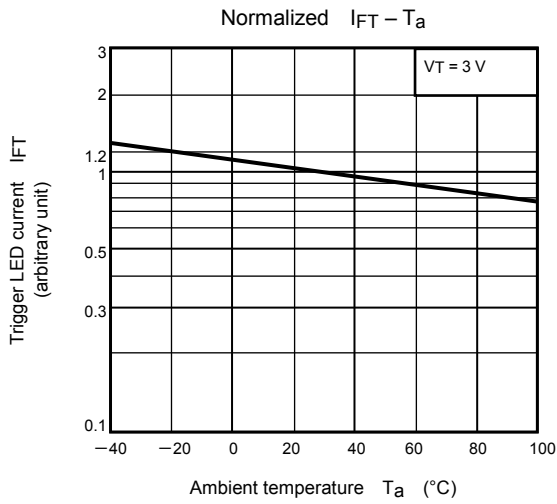


Note 3: impulse noise durability test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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