

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP3021(S),TLP3022(S),TLP3023(S)

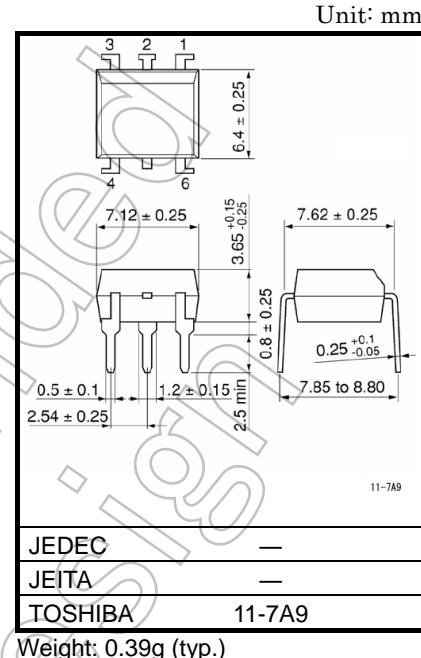
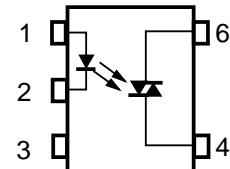
OFFICE MACHINE
 HOUSEHOLD USE EQUIPMENT
 TRIAC DRIVER
 SOLID STATE RELAY

The TOSHIBA TLP3021 (S), TLP3022 (S) and TLP3023 (S) consist of photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP.

- Peak Off-State Voltage : 400 V (min)
- Trigger LED Current : 15 mA (max) (TLP3021(S))
 10 mA (max) (TLP3022(S))
 5 mA (max) (TLP3023(S))
- On-State Current : 100 mA (max)
- Isolation Voltage : 5000Vrms(Min)
- UL Recognized : UL1577, File No.E67349
- cUL approved : CSA Component Acceptance Service
 No. 5A, File No.E67349
- Option (D4) type VDE approved: EN60747-5-5,
 EN60065, EN60950-1 (Note 1)
 EN62368-1(Pending) (Note1)

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

	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	0.5 mm (Min)	0.5 mm (Min)

**Pin Configuration
(top view)**

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

Start of commercial production
 1986-11

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 (100μs pulse, 100pps)	I _{FP}	1	A	
	Reverse Voltage	V _R	5	V	
	Power Dissipation	P _D	100	mW	
	Power Dissipation Derating (Ta≥25°C)	ΔP _D /°C	-1.0	mW /°C	
	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)	ΔI _T /°C	-1.1	mA /°C	
	Peak On-State Current (100μs pulse, 120pps)	I _{TP}	2	A	
	Peak Nonrepetitive Surge Current (Pw=10ms)	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 to 150	°C	
Operating Temperature Range		T _{opr}	-40 to 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,1min., R.H.≤60%)		(Note 2)	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 2) Device considered a two terminal device :Pins1,2 and 3 shorted together and pin4 and pin6 shorted together.

Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{AC}	—	—	120	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.

*In The case of TLP3022

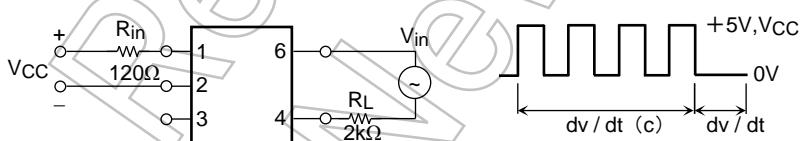
Individual Electrical Characteristics (Ta=25°C)

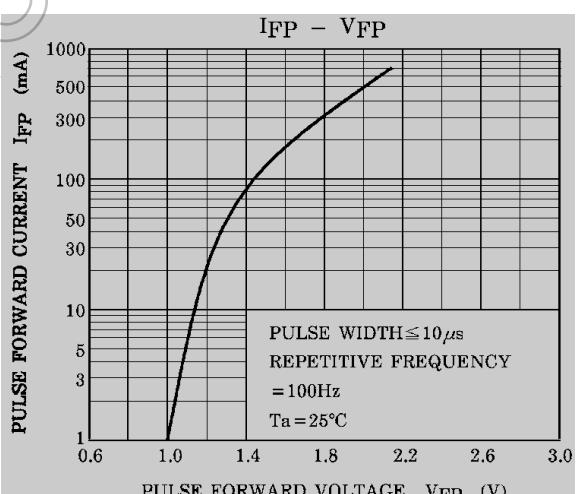
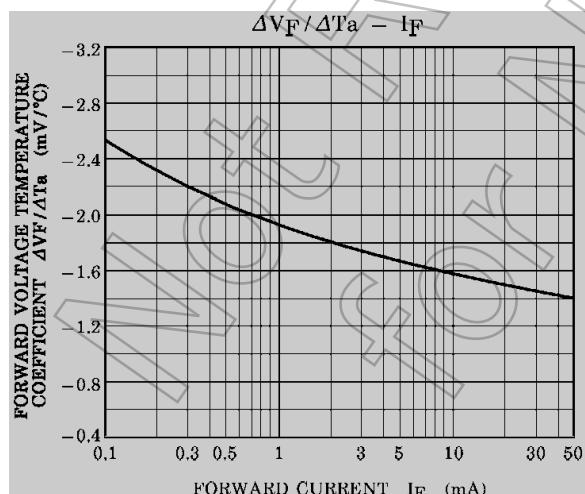
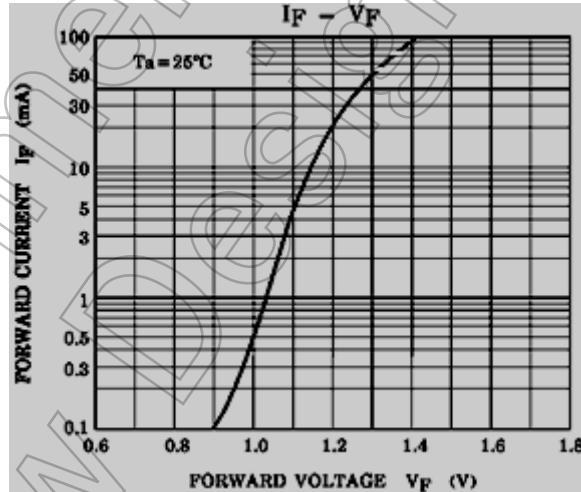
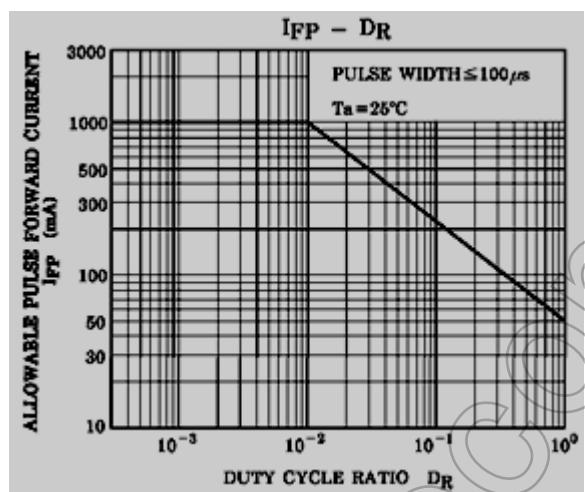
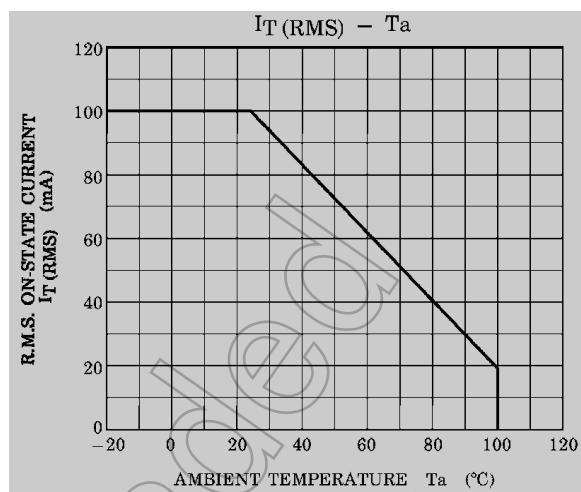
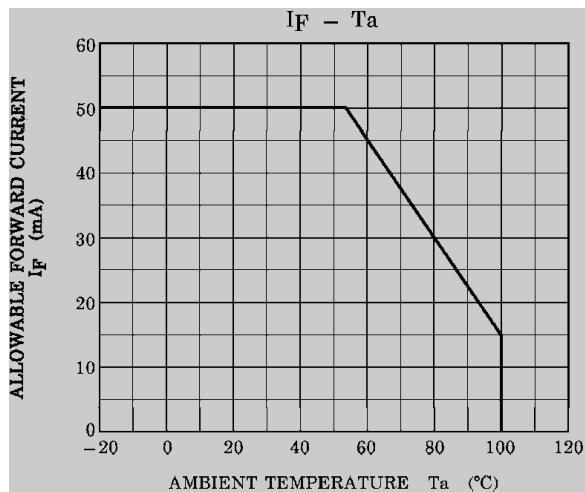
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I _R	V _R = 5 V	—	—	10	μA
	Capacitance	C _T	V = 0 V, f=1MHz	—	10	—	pF
ROCTEDE	Peak Off-State Current	I _{DRM}	V _{DRM} =400V	—	10	1000	nA
	Peak On-State Voltage	V _{TM}	I _{TM} =100mA	—	1.7	3.0	V
	Holding Current	I _H	—	—	0.6	—	mA
DE	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)

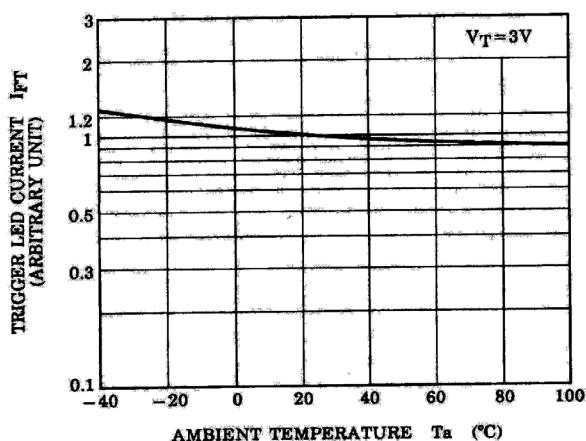
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Trigger LED Current	TLP3021(S)	I _{FT}	V _T =3V	—	—	15	mA	
	TLP3022(S)			—	5	10		
	TLP3023(S)			—	—	5		
Capacitance (Input to Output)	C _S	VS=0V , f=1MHz		—	0.8	—	pF	
Isolation Resistance	R _S	VS=500V(R.H.≤60%)		5×10 ¹⁰	10 ¹⁴	—	Ω	
Isolation Voltage	BV _S	AC , 1minute	5000	—	—	—	Vrms	
		AC , 1second,in oil	—	10000	—	—		
		DC , 1minute,in oil	—	10000	—	—	Vdc	

Fig. 1 dv / dt test circuit

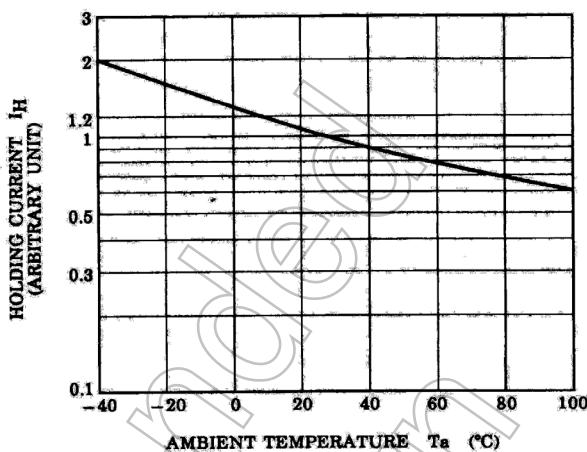




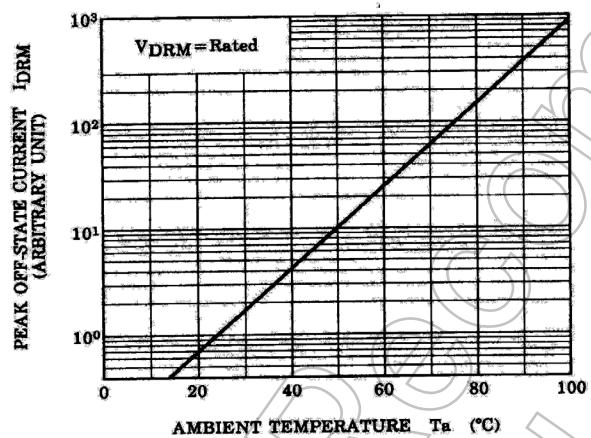
NORMALIZED I_{FT} – T_a



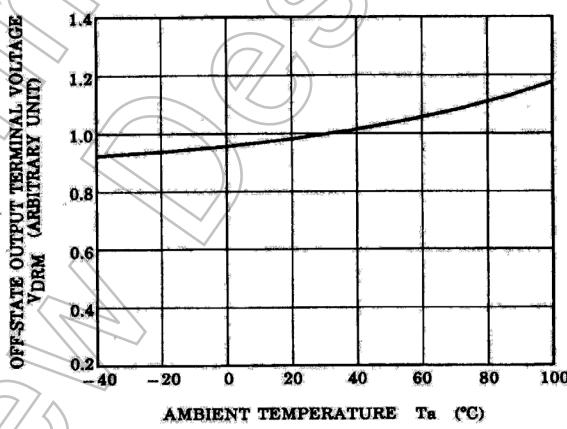
NORMALIZED I_H – T_a



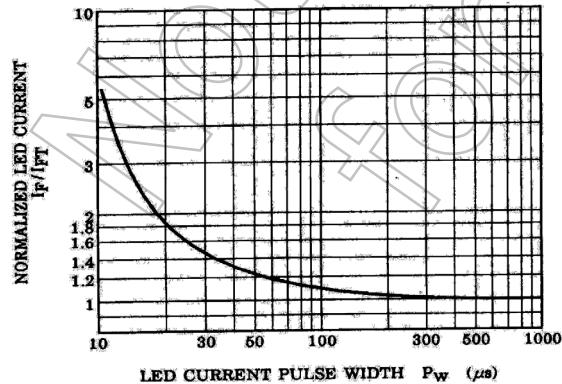
NORMALIZED I_{DRM} – T_a



NORMALIZED V_{DRM} – T_a



NORMALIZED LED CURRENT
– LED CURRENT PULSE WIDTH



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