

TOSHIBA PHOTOCOUPLER GaAs IRED + PHOTO-TRIAC

TLP166J

TRIAC DRIVE

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

SOLID STATE RELAY

The TOSHIBA MINI FLAT COUPLER TLP166J is a small outline coupler, suitable for surface mount assembly.

The TLP166J consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

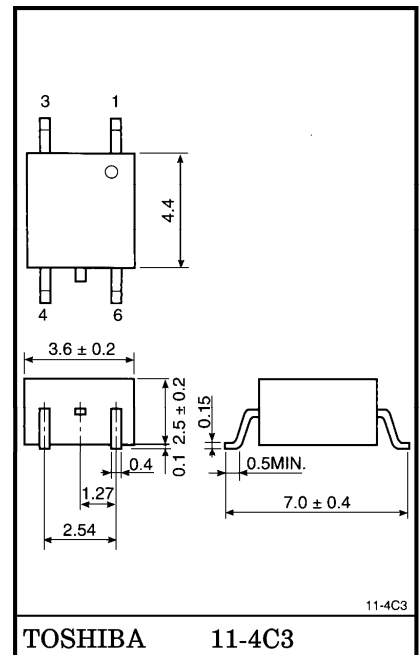
- Peak Off-State Voltage : 600 V (Min.)
- Trigger LED Current : 10 mA (Max.)
- On-State Current : 70 mA (Max.)
- Isolation Voltage : 2500 Vrms (Min.)
- UL Recognized : UL1577, File No. E67349
- Option (V4) type
 VDE Approved : VDE0884 Satisfied
 Maximum Operating Insulation Voltage : 565 Vpk
 Highest Permissible Over Voltage : 4000 Vpk

TRIGGER LED CURRENT

TYPE (Note 1)	TRIGGER LED CURRENT (mA)		MARKING OF CLASSIFICATION
	V _T = 6 V, T _a = 25°C		
	Min.	Max.	
(IFT7)	—	7	T7
None	—	10	T7, blank

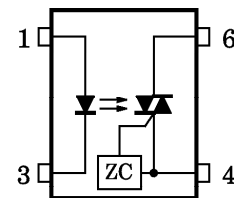
* Exp. IFT7 : TLP166J (IFT7)
 (Note 1) : Application type name for certification test, please use standard product type name, i.e.
 TLP166J (IFT7) : TLP166J

Unit in mm



Weight : 0.09 g

PIN CONFIGURATIONS



1. ANODE
3. CATHODE
4. TERMINAL 1
6. TERMINAL 2

980910EBC1

● TOSHIBA is continually working to improve the quality and the 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 observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product 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 products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

● Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

● The products described in this document are subject to the foreign exchange and foreign trade laws.

● The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.

● The information contained herein is subject to change without notice.

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	
	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)	70	mA
		Ta = 70°C		40	
	On-State Current Derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-0.67	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 2)	BV_S	2500	Vrms		

(Note 2) : Device considered a two terminal device : Pins 1 and 3 shorted together and 4 and 6 shorted together.

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

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	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Peak Off-State Current	I_{DRM}	$V_{DRM} = 600 \text{ V}$	—	30	1000	nA
	Peak On-State Voltage	V_{TM}	$I_{TM} = 70 \text{ mA}$	—	1.7	2.8	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{in} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$ (Note 3)	200	500	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$I_T = 15 \text{ mA}, V_{in} = 60 \text{ Vrms}$ (Note 3)	—	0.2	—	$\text{V}/\mu\text{s}$

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	$V_T = 6 \text{ V}$	—	—	10	mA
Inhibit Voltage	V_{IH}	$I_F = \text{Rated } I_{FT}$	—	—	50	V
Leakage in Inhibited State	I_{IH}	$I_F = \text{Rated } I_{FT}$ $V_T = \text{Rated } V_{DRM}$	—	—	600	μA
Capacitance Input to Output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	1×10^{12}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc

(Note 3) : dv/dt TEST CIRCUIT

