

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

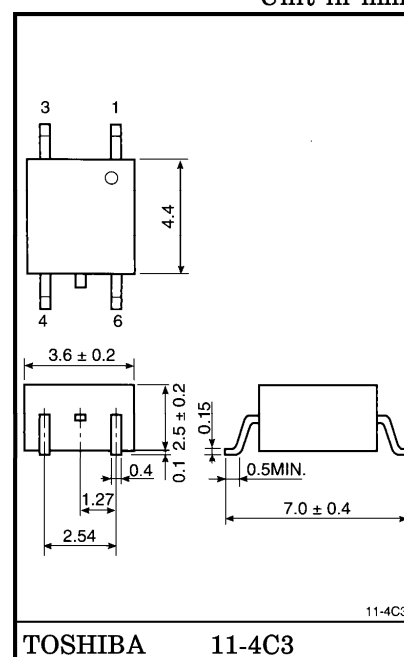
TYPE (Note 1)	TRIGGER LED CURRENT (mA)		MARKING OF CLASSIFICATION
	V _T = 6 V, T _a = 25°C		
	Min.	Max.	
(IFT7)	—	7	T7
None	—	10	T7, blank

* Exp. IFT7 : TLP166J (IFT7)

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

TLP166J (IFT7) : TLP166J

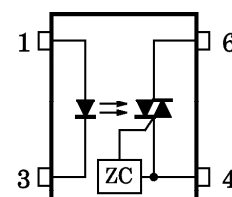
Unit in mm



TOSHIBA 11-4C3

Weight : 0.09 g

PIN CONFIGURATIONS



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

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MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta $\geq$ 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	I_T (RMS)	70	mA
			40	
	On-State Current Derating (Ta $\geq$ 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. $\leq$ 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}	$V_{\text{DRM}} = 600 \text{ V}$	—	30	1000	nA
	Peak On-State Voltage	V_{TM}	$I_{\text{TM}} = 70 \text{ mA}$	—	1.7	2.8	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{\text{in}} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$ (Note 3)	200	500	—	$\text{V} / \mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$I_T = 15 \text{ mA}, V_{\text{in}} = 60 \text{ Vrms}$ (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}	$I_F = \text{Rated } I_{\text{FT}}$	—	—	50	V
Leakage in Inhibited State	I_{IH}	$I_F = \text{Rated } I_{\text{FT}}$ $V_T = \text{Rated } V_{\text{DRM}}$	—	—	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