

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

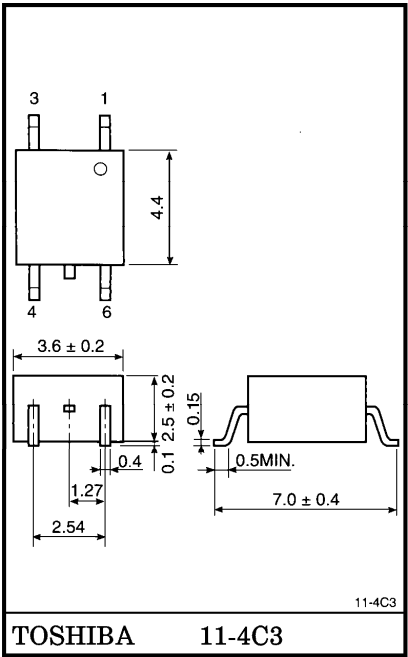
VDE Approved : VDE0884 Satisfied
Maximum Operating Insulation Voltage : 565 Vpk
Highest Permissible Over Voltage : 4000 Vpk

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

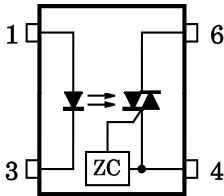
* Exp. IFT7 : TLP166J (IFT7)
(Note 1) : Application type name for certification test, please use standard product type name, i.e.
TLP166J (IFT7) : TLP166J

Unit in mm



Weight : 0.09 g

PIN CONFIGURATIONS



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

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- 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.
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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