

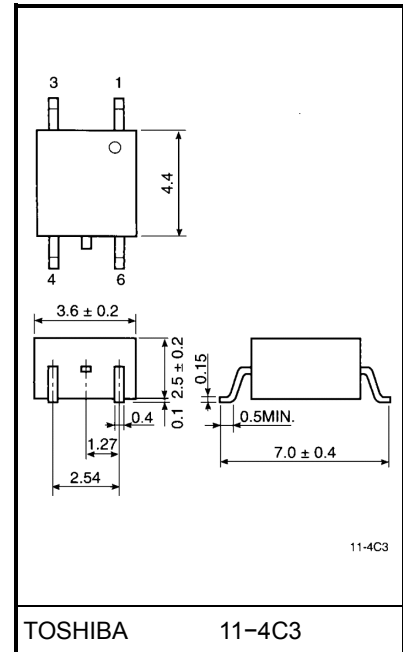
# TLP166J

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: 600V(min.)
- Trigger LED current: 10mA(max.)
- On-state current: 70mA(max.)
- Isolation voltage: 2500Vrms(min.)
- UL recognized: UL1577, file no. E67349
- Option(V4) type  
 VDE approved: VDE0884 satisfied  
 Maximum operating insulation voltage: 565Vpk  
 Highest permissible over voltage: 4000Vpk

Unit in mm



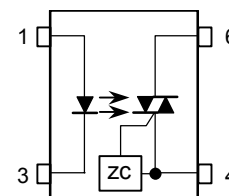
Weight: 0.09 g

## Trigger LED Current

Type (Note 1)	Trigger LED Current (mA)		Marking Of Classification
	V <sub>T</sub> =6V, T <sub>a</sub> =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): TLP166JCircuit

## Pin Configurations



1. Anode
3. Cathode
4. Terminal 1
6. Terminal 2

## 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 (100µs pulse, 100pps)	$I_{FP}$	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	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 (100µs pulse, 120pps)	$I_{TP}$	2	A
	Peak nonrepetitive surge current (PW=10ms, 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 (10s)		$T_{sol}$	260	°C
Isolation voltage (AC, 1min., 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

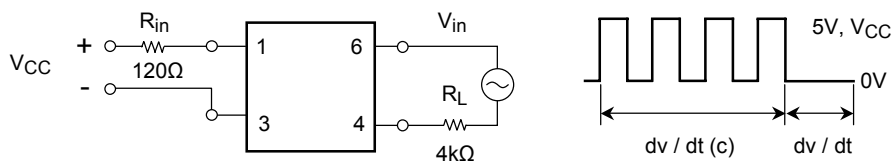
## Electrical Characteristics (Ta = 25°C)

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	$\mu\text{A}$
	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	—	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	—	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	$\mu\text{A}$
Capacitance input to output	$C_S$	$V_S=0, f=1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S=500\text{V}, R.H.\leq 60\%$	$1\times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	Vrms
		DC, 1 minute, in oil	—	5000	—	Vdc

(Note 3):  $dv/dt$  Test circuit



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