

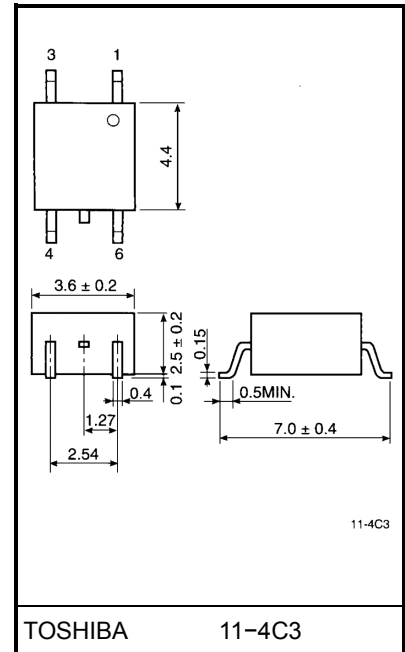
# TLP165J

- Triac Drive
- Programmable Controllers
- AC-Output Module
- Solid State Relay

The TOSHIBA mini flat coupler TLP165J is a small outline coupler, suitable for surface mount assembly. The TLP165J 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: VDE 0884 satisfied  
 Maximum operating insulation voltage: 565Vpk  
 Highest permissible over voltage: 4000Vpk

Unit in mm



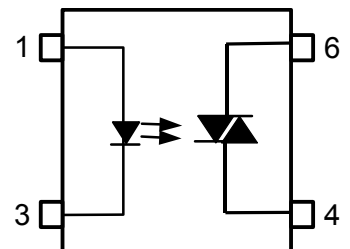
Weight: 0.09 g

## Trigger LED Current

Type (Note 1)	Trigger LED Current (mA)		Marking Of Classification
	$V_T=6V, T_a=25^\circ C$		
	Min.	Max.	
(IFT7)	—	7	T7
None	—	10	T7, blank

\* Exp. rank IFT7: TLP165J (IFT7)  
 (Note 1) Application type name for certification test, please use standard product type name, i.e.  
 TLP165J(IFT7): TLP165J

## 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, 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	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, 120 pps)	$I_{TP}$	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, 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

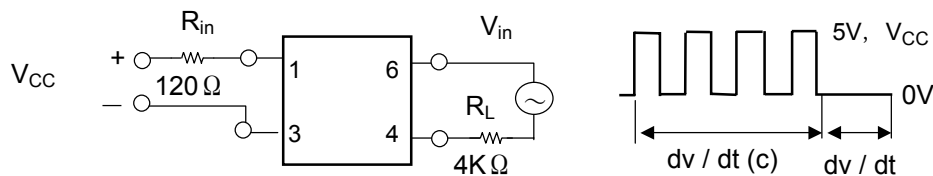
## Electrical Characteristics (Ta = 25°C)

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	$\mu\text{A}$
	Capacitance	$C_T$	$V=0, f=1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM}=600\text{V}$	—	10	1000	nA
	Peak on-state voltage	$V_{TM}$	$I_{TM}=70\text{mA}$	—	1.7	2.8	V
	Holding current	$I_H$	—	—	1.0	—	mA
	Critical rate of rise of off-state voltage	$dv/dt$	$V_{in}=240\text{Vrms}, T_a=85^\circ\text{C}$ (Note 3)	—	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
Capacitance input to output	$C_S$	$V_S=0, f=1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S=500\text{V}, \text{R.H.} \leq 60\%$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	Vrms
		DC, 1 minute, in oil	—	5000	—	Vdc
Turn-on time	$t_{ON}$	$V_D=6 \rightarrow 4\text{V}, R_L = 100\Omega$ $I_F = \text{Rated } I_{FT} \times 1.5$	—	—	100	$\mu\text{s}$

(Note 3)  $dv/dt$  test circuit



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