

# TLP191B

Telecommunication  
 Programmable Controllers  
 MOS Gate Driver  
 MOS FET Gate Driver

The TOSHIBA mini-flat coupler TLP191B is a small outline coupler, suitable for surface mount assembly.  
 The TLP191B consists of a GaAlAs light emitting diode, optically coupled to a series connected photo diode array with shunt resistor which is suitable for MOS FET gate drive.

- Open voltage: 7.0 V (min)
- Short current: 24  $\mu$ A (min)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: UL1577, file no.E67349

### Absolute Maximum Ratings (Ta = 25°C)

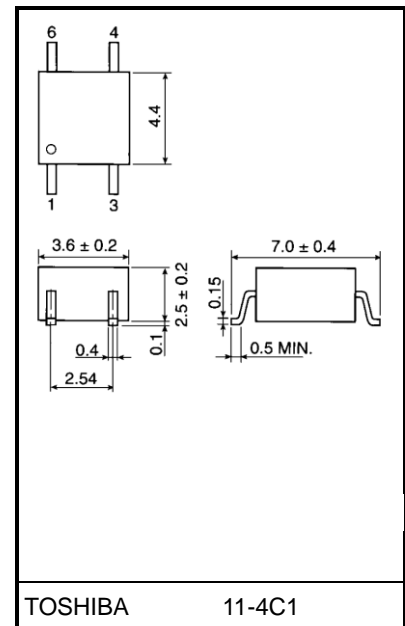
Characteristic		Symbol	Rating	Unit
LED	Forward current	$I_F$	50	mA
	Forward current derating (Ta $\geq$ 25°C)	$\Delta I_F / ^\circ C$	-0.5	mA/°C
	Pulse forward current (100 $\mu$ s pulse, 100 pps)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	3	V
	Junction temperature	$T_j$	125	°C
Detector	Forward current	$I_{FD}$	50	$\mu$ A
	Reverse voltage	$V_{RD}$	10	V
	Junction temperature	$T_j$	125	°C
Storage temperature range		$T_{stg}$	-55 to 125	°C
Operating temperature range		$T_{opr}$	-40 to 85	°C
Lead soldering temperature (10 s)		$T_{sol}$	260	°C
Isolation voltage (AC, 60 s, R.H. $\leq$ 60%) (Note 1)		BVs	2500	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

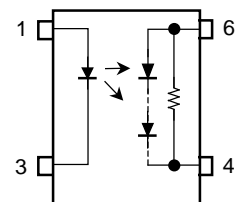
Note 1: Device considered a two terminal device: Pins 1 and 3 shorted together and pins 4 and 6 shorted together.

Unit: mm



Weight: 0.09 g (typ.)

### Pin Configuration (top view)



- 1 . Anode
- 3 . Cathode
- 4 . Cathode
- 6 . Anode

Start of commercial production  
 1990-11

## Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Forward current	$I_F$	—	20	25	mA
Operating temperature	$T_{opr}$	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	$V_F$	$I_F = 10 \text{ mA}$	1.2	1.4	1.7	V
	Reverse current	$I_R$	$V_R = 3 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	60	pF
Detector	Forward voltage	$V_{FD}$	$I_{FD} = 10 \mu\text{A}$	—	7	—	V
	Reverse current	$I_{RD}$	$V_{RD} = 10 \text{ V}$	—	7	—	$\mu\text{A}$

## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Open voltage	$V_{OC}$	$I_F = 20 \text{ mA}$	7	8	—	V
Short current	$I_{SC}$	$I_F = 20 \text{ mA}$	24	40	—	$\mu\text{A}$

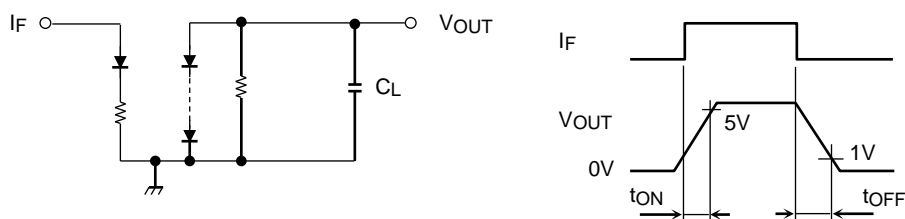
## Isolation Characteristics (Ta = 25°C)

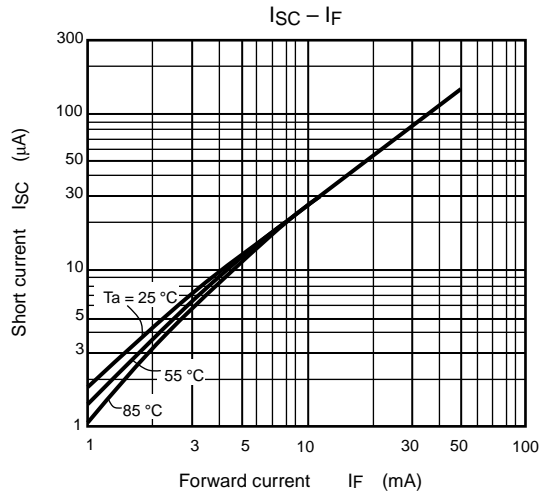
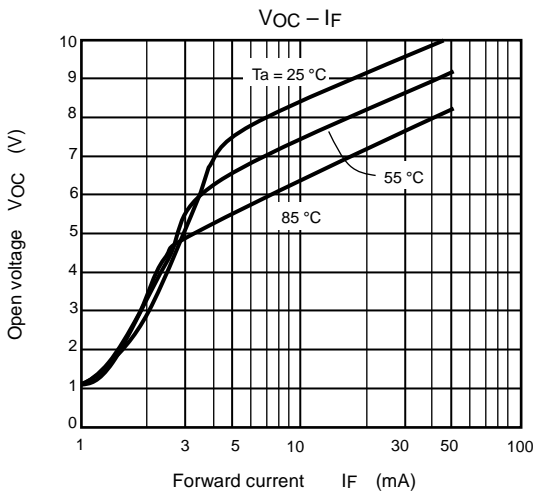
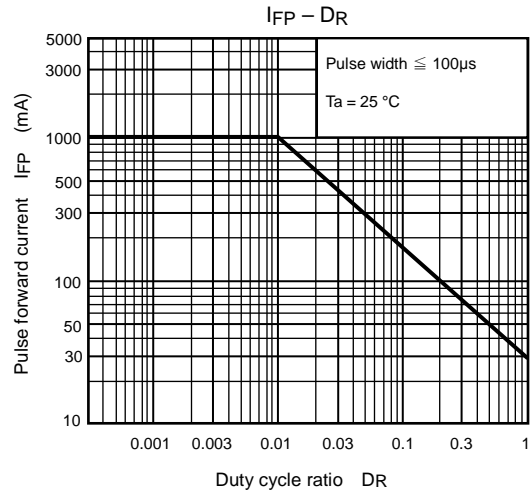
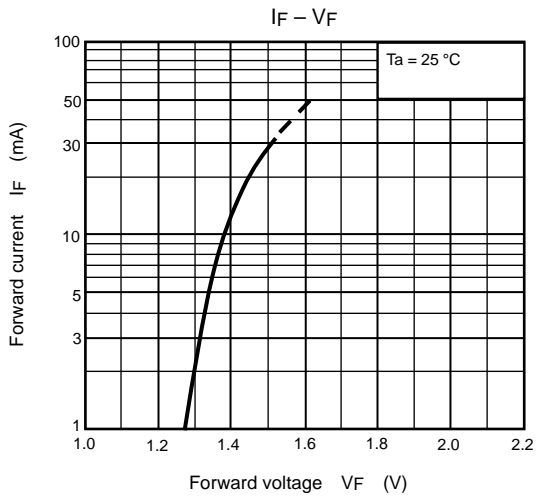
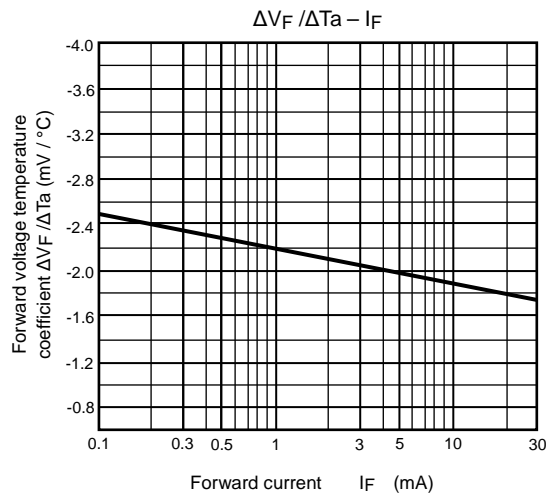
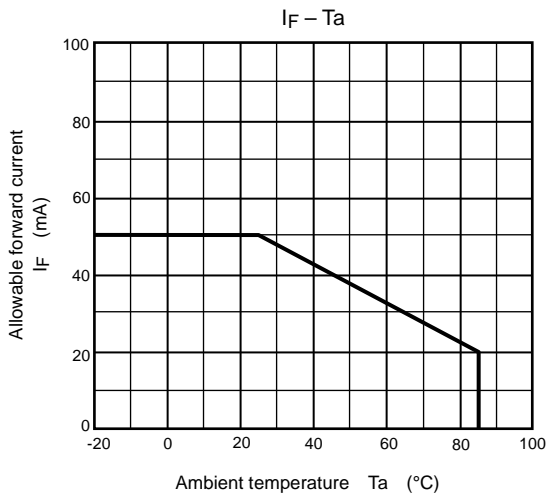
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 60 s	2500	—	—	Vrms
		AC, 1 s in oil	—	5000	—	Vrms
		DC, 60 s in oil	—	5000	—	Vdc

## Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$I_F = 20 \text{ mA}, C_L = 1000 \text{ pF}$ (Fig.1)	—	0.2	—	ms
Turn-off time	$t_{OFF}$		—	3	—	

Fig. 1 Switching time test circuit





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