

# TLP591B

Telecommunications  
 Programmable Controllers  
 MOS Gate Drivers  
 MOSFET Gate Drivers

The TOSHIBA TLP591B consists of an infrared emitting diode optically coupled to a series-connected photo-diode array in a six-lead plastic DIP package.

The TLP591B is suitable for MOS FET gate drivers.

The TLP591B has an internal shunt resistor to optimize switching speed.

- UL-recognized: UL 1577, File No.E67349

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

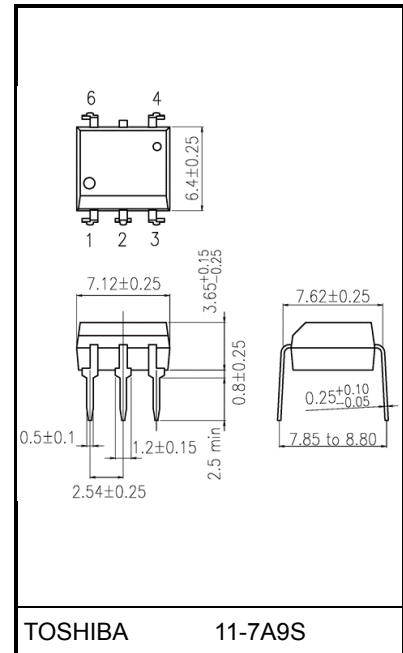
Characteristic		Symbol	Rating	Unit
LED	Forward current	IF	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔIF /°C	-0.5	mA /°C
	Pulse forward current (100 μs pulse, 100 pps)	IFP	1	A
	Reverse voltage	VR	3	V
	Diode power dissipation	PD	100	mW
	Diode power dissipation derating (Ta ≥ 25°C)	ΔPD /°C	-1.0	mW /°C
	Junction temperature	Tj	125	°C
Detector	Forward current	IFD	50	μA
	Reverse voltage	VRD	10	V
	Output power dissipation	PO	0.5	mW
	Junction temperature	Tj	125	°C
Storage temperature range		Tstg	-55 to 125	°C
Operating temperature range		Topr	-40 to 85	°C
Lead soldering temperature (10 s)		Tsol	260	°C
Isolation voltage (AC, 60 s, R.H. ≤ 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.).

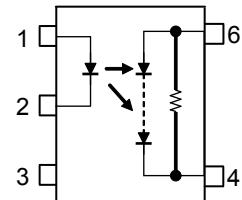
Note 1: Device considered a two terminal device: Pins 1, 2 and 3 shorted together, and pins 4 and 6 shorted together.

Unit: mm



Weight: 0.39 g (typ.)

### Pin Configuration (top view)



- 1 : Anode(LED)
- 2 : Cathode(LED)
- 3 : NC
- 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	—	$\mu\text{A}$

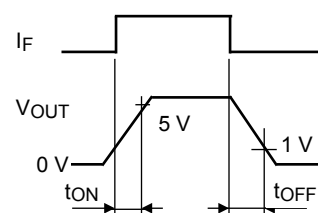
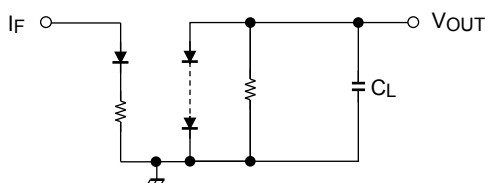
## Isolation Characteristics (Ta = 25°C)

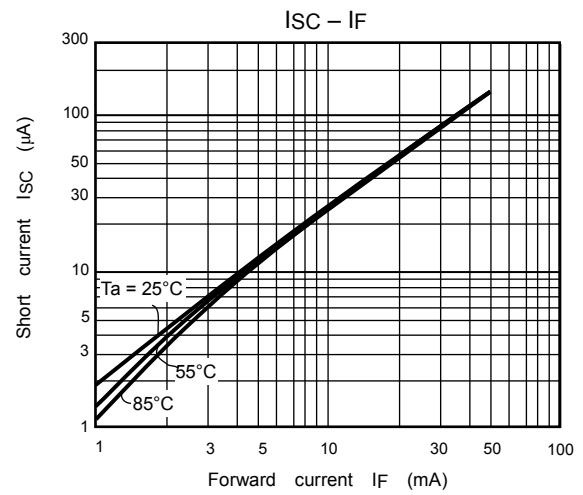
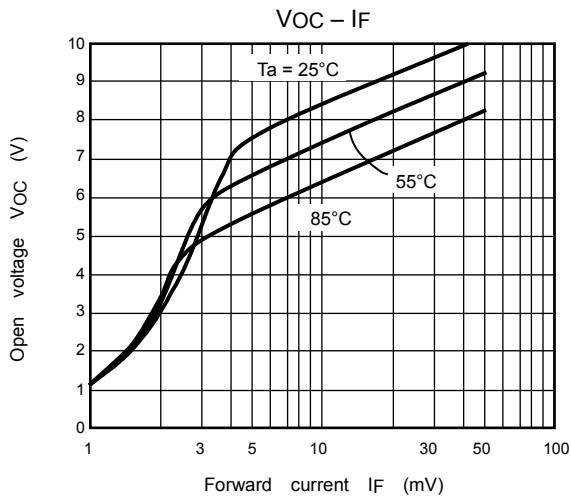
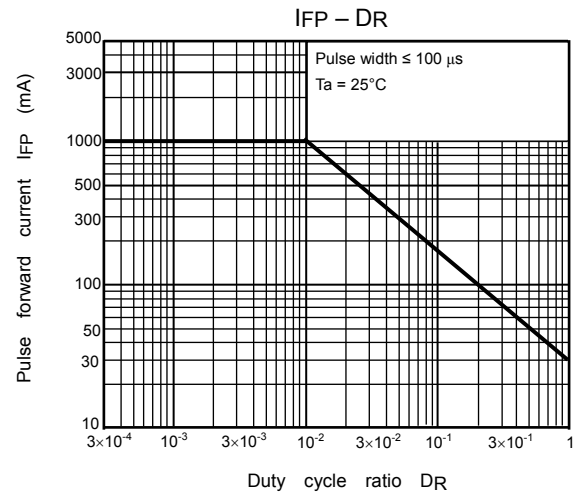
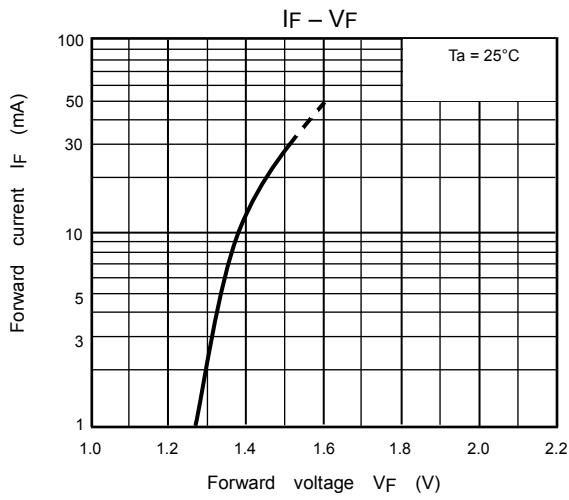
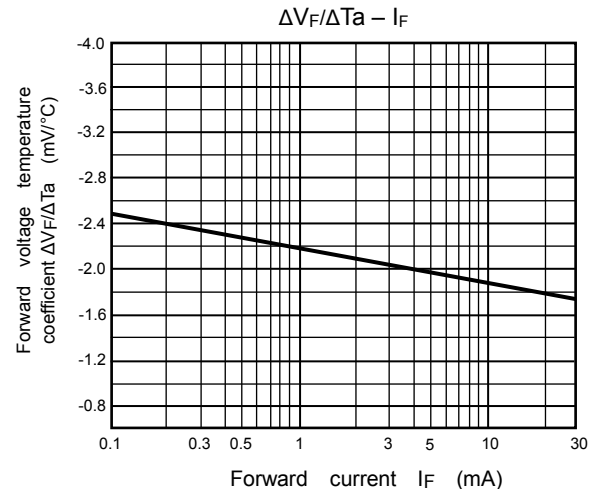
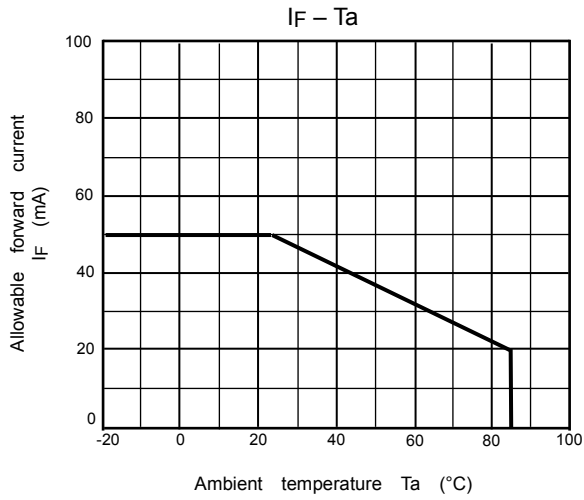
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance (input to output)	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60 \%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$B_{VS}$	AC, 60 s	2500	—	—	Vrms

## Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$I_F = 20 \text{ mA}, C_L = 1000 \text{ pF}$ (Note 2)	—	0.2	—	ms
Turn-off time	$t_{OFF}$		—	3	—	ms

Note 2: Switching time test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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