

TOSHIBA Photocoupler GaAlAs Ired & Photo-Diode Array

# TLP590B

Telecommunication  
 Programmable Controllers  
 Mos Gate Driver  
 MOS FET Gate Driver

The TOSHIBA TLP590B consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a series connected photo-diode array in a six lead plastic DIP package.  
 TLP590B is suitable for MOS FET gate driver.

- UL recognized: UL1577, file No. E67349

### Short Current

Type Name	Classification	Short Current		Marking Of Classification
		(min.)	I <sub>F</sub>	
TLP590B	C20	20μA	10mA	20
	Standard	12μA		20, blank

(Note) Application type name for certification test, please use standard product type name, i.e.

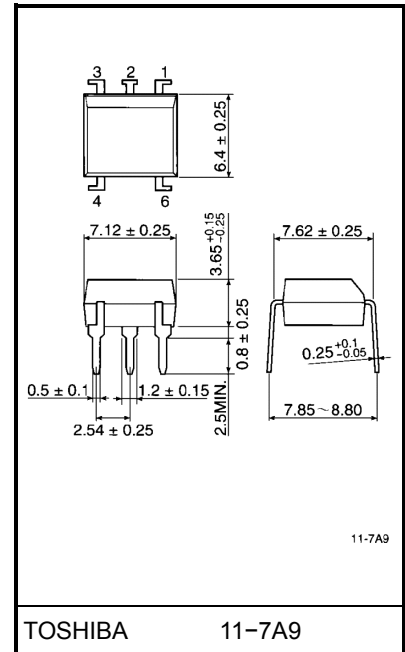
TLP590B(C20): TLP590B

### Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
LED	Forward current	I <sub>F</sub>	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI <sub>F</sub> / °C	-0.5	mA / °C
	Pulse forward current (100μs pulse, 100 pps)	I <sub>FP</sub>	1	A
	Reverse voltage	V <sub>R</sub>	3	V
	Junction temperature	T <sub>j</sub>	125	°C
Detector	Foward current	I <sub>FD</sub>	50	μA
	Reverse voltage	V <sub>RD</sub>	10	V
	Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range		T <sub>stg</sub>	-55~125	°C
Operating temperature range		T <sub>opr</sub>	-40~85	°C
Lead soldering temperature (10sec.)		T <sub>sol</sub>	260	°C
Isolation voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)		BV <sub>S</sub>	2500	V <sub>rms</sub>

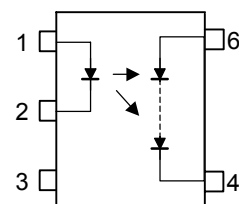
(Note 1) Device considered a two terminal device: Pins 1, 2 and 3 shorted together, and pins 4 and 6 shorted together.

Unit in mm



Weight: 0.39g

### Pin Configuration(top view)



- 1. : Anode
- 2. : Cathode
- 3. : NC
- 4. : Cathode
- 6. : Anode

## Recommended Operating Conditions

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

## Individual 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	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	60	pF
Detector	Forward voltage	$V_{FD}$	$I_{FD} = 10 \mu\text{A}$	—	7	—	V
	Reverse current	$I_{RD}$	$V_{RD} = 10 \text{ V}$	—	1	—	nA
	Capacitance (anode to cathode)	$C_{TD}$	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Open voltage	$V_{OC}$	$I_F = 10 \text{ mA}$	7.0	8.0	—	V
Short current	$I_{SC}$	$I_F = 10 \text{ mA}$	12	20	—	$\mu\text{A}$

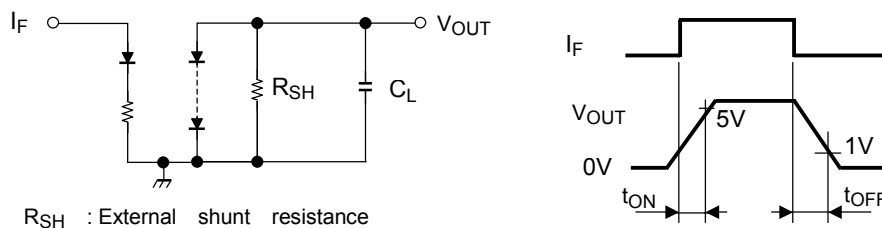
## Isolation Characteristics (Ta = 25°C)

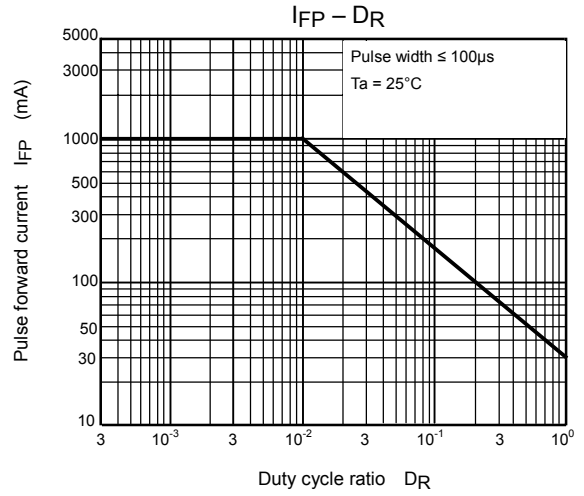
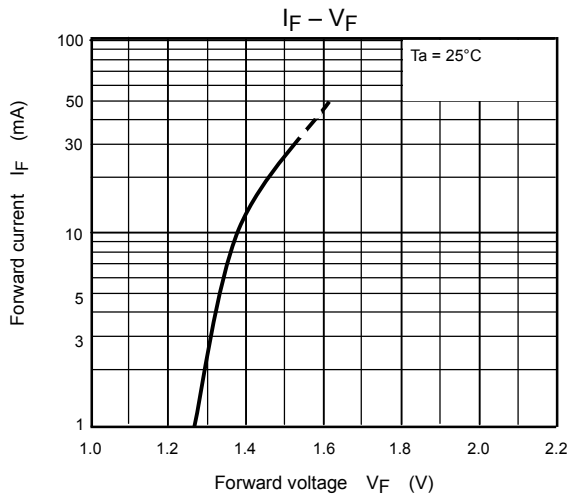
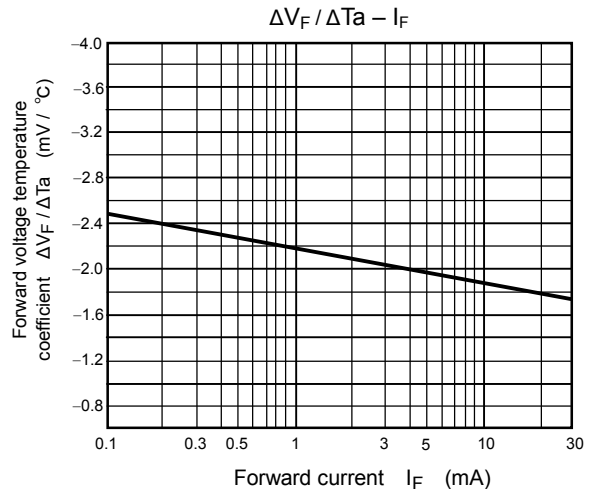
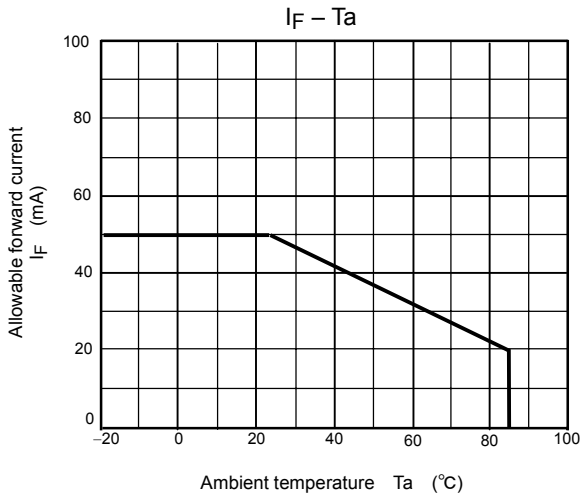
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC,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

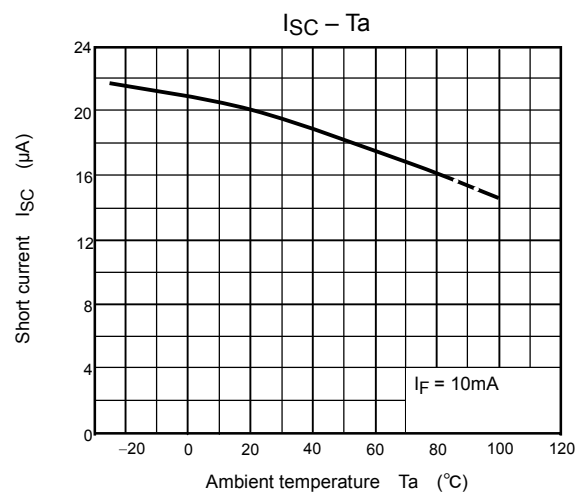
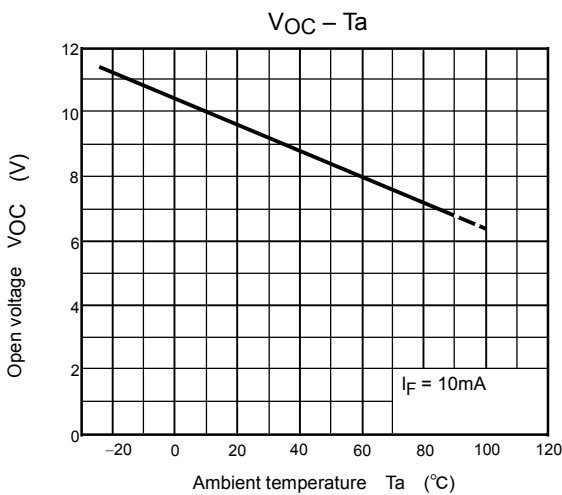
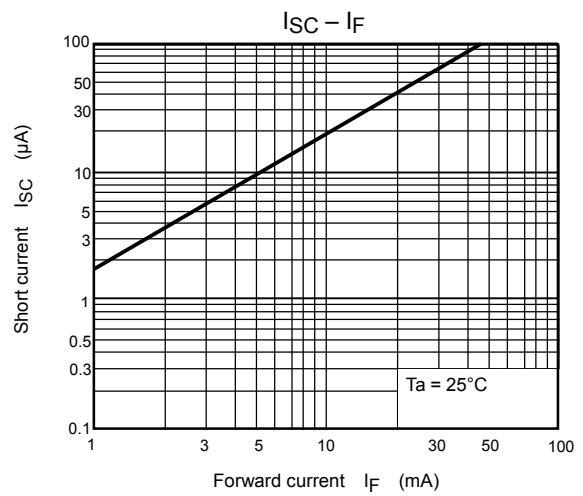
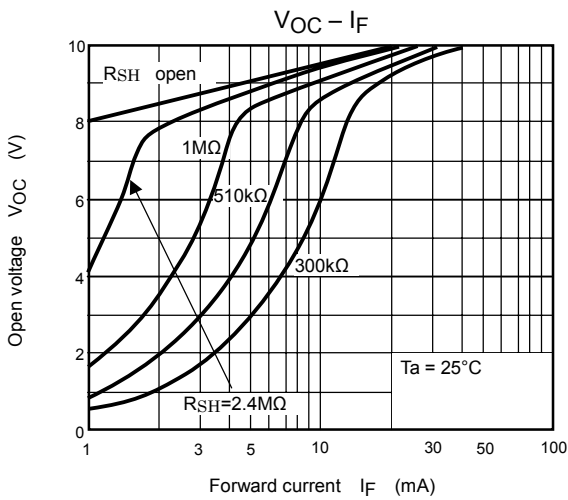
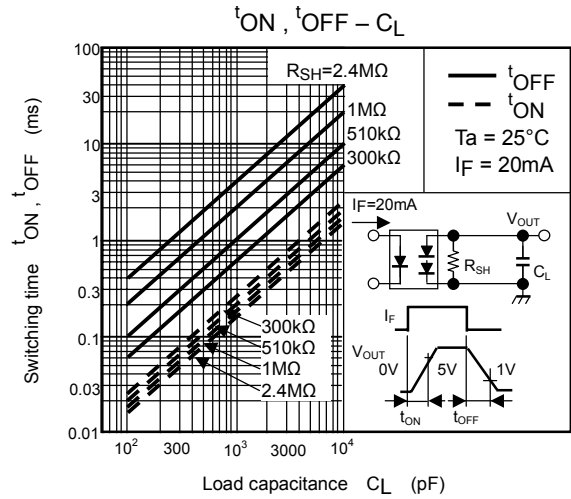
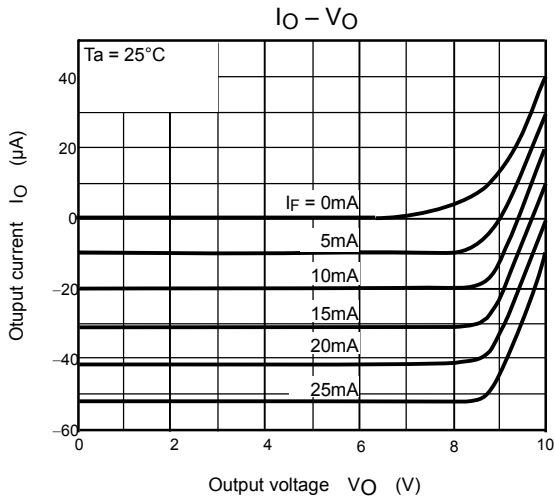
## Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on time	$t_{on}$	$I_F = 20 \text{ mA}, R_{SH} = 510 \text{ k}\Omega$ $C_L = 1000 \text{ pF}$ (Fig.1)	—	0.2	—	ms
Turn-off time	$t_{off}$		—	1	—	ms

Fig. 1 Switching time test circuit







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