

TOSHIBA Photocoupler GaAlAs Ired & Photo-Diode Array

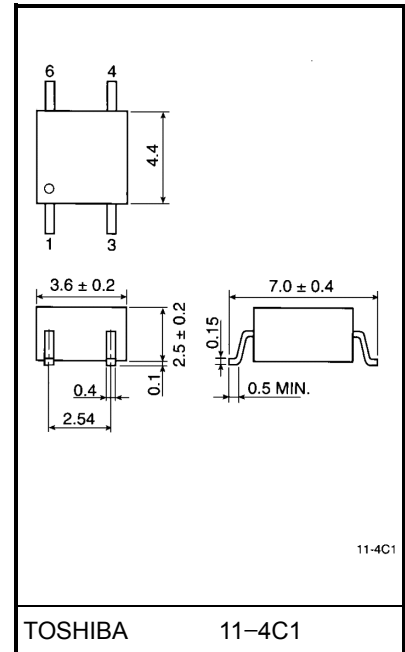
# TLP190B

Telecommunication  
 Programmable Controllers  
 MOS Gate Driver  
 MOS FET Gate Driver

The TOSHIBA mini flat coupler TLP190B is a small outline coupler, suitable for surface mount assembly. The TLP190B consists of a GaAlAs light emitting diode, optically coupled to a series connected photo diode array which is suitable for MOS FET gate drive.

- Open voltage: 7.0V (min.)
- Short current: 12.0 $\mu$ A (min.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349

Unit in mm



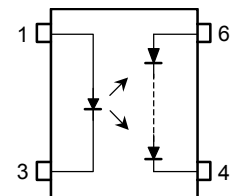
Weight: 0.09 g

## Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	$I_F$	50	mA
	Forward current derating (Ta $\geq$ 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.5	mA / °C
	Pulse forward current (100 $\mu$ s pulse 100pps)	$I_{FP}$	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		$T_{stg}$	-55~125	°C
Operating temperature range		$T_{opr}$	-40~85	°C
Lead soldering temperature (10 s)		$T_{sol}$	260	°C
Isolation voltage (AC, 1 min., R.H. $\leq$ 60%) (Note)		$BV_S$	2500	Vrms

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

## Pin Configuration (top view)



- 1. Anode
- 3. Cathode
- 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	$V_{FD}$	$I_C = 10 \mu\text{A}$	—	7	—	V
	Reverse current	$I_{RD}$	$V_R = 10 \text{ V}$	—	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	8	—	V
Short current	$I_{SC}$	$I_F = 10 \text{ mA}$	12	20	—	$\mu\text{A}$

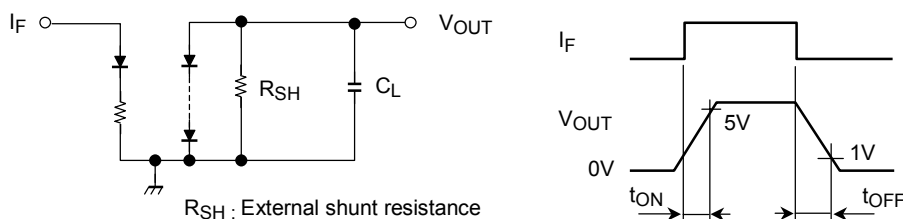
## Isolation Characteristics (Ta = 25°C)

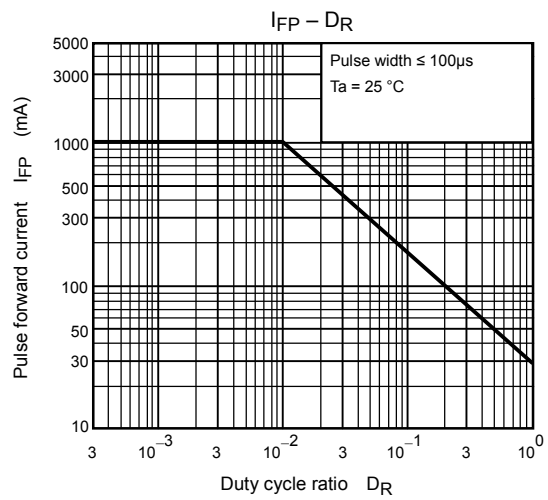
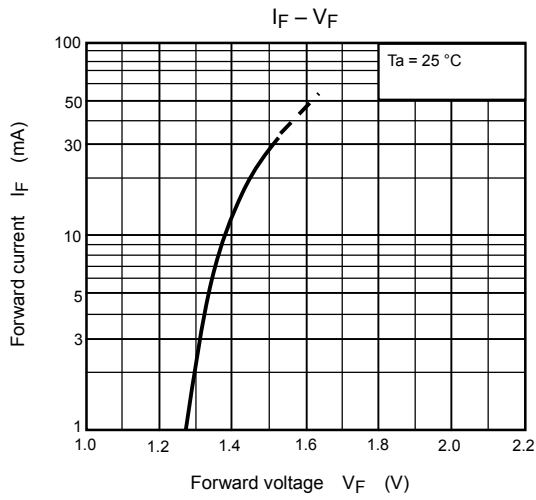
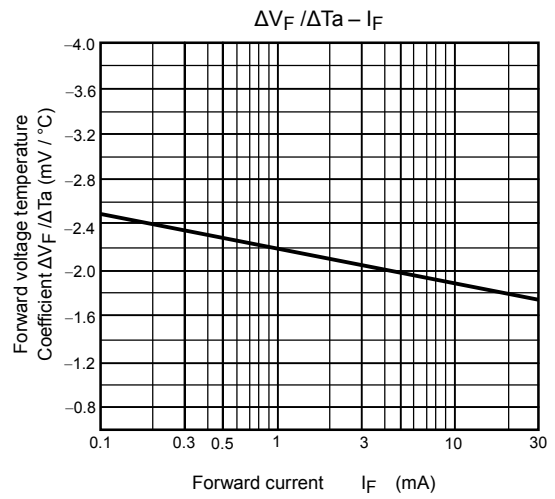
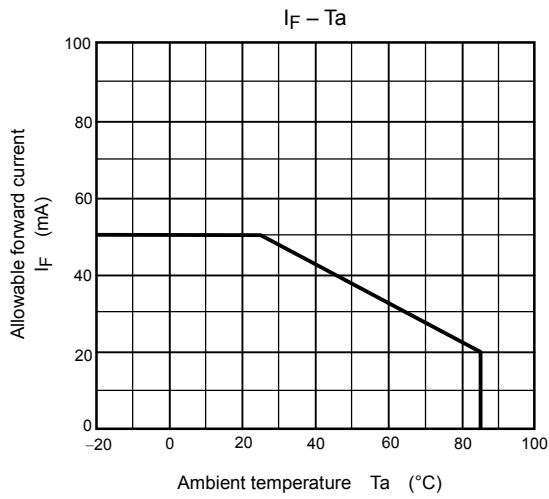
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC,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

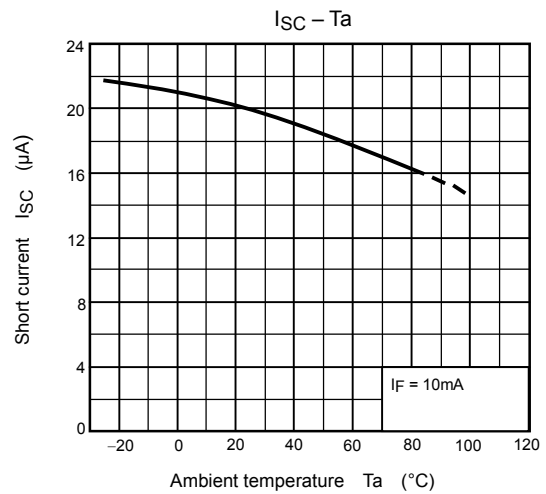
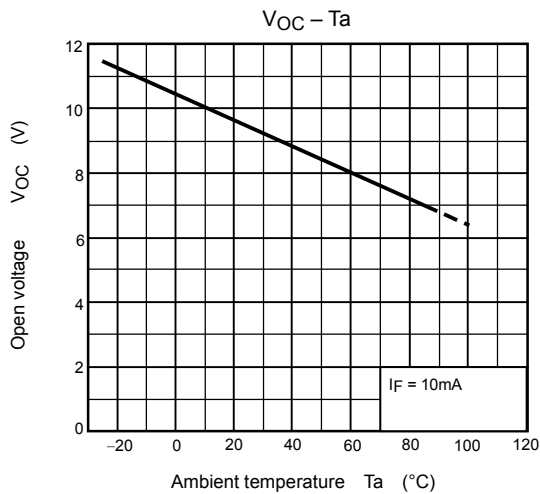
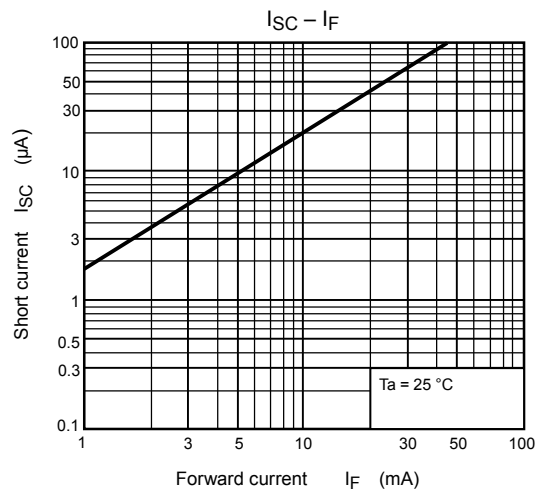
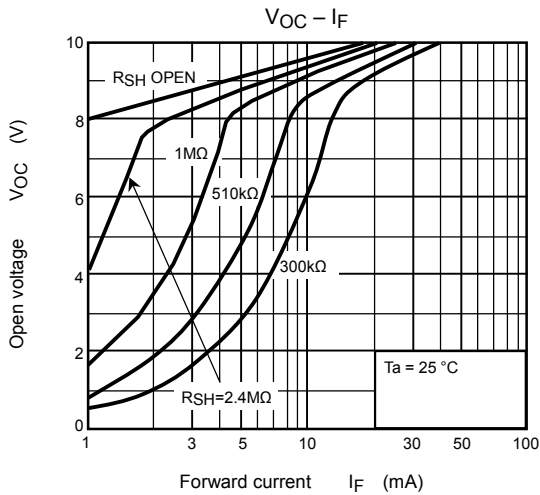
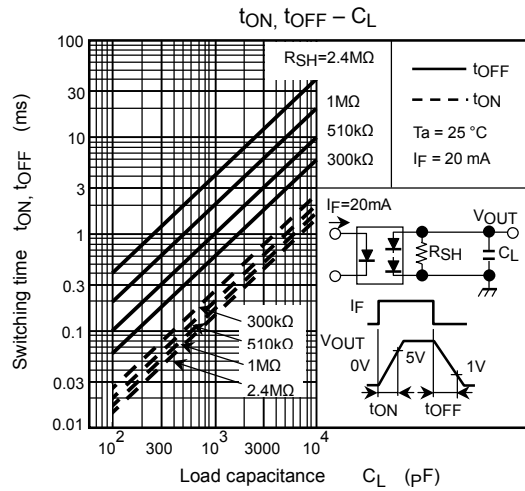
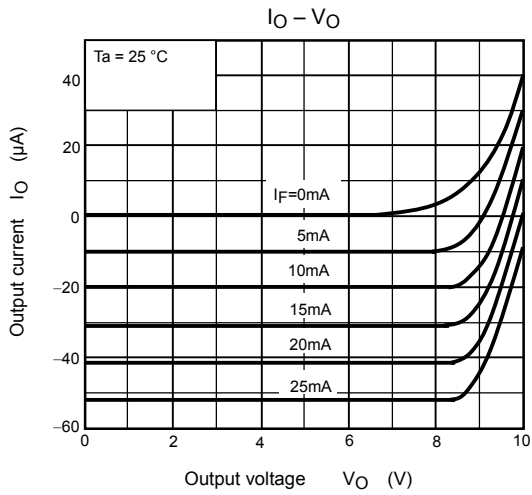
## Switching Characteristics (Ta = 25°C)

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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