

TOSHIBA Photocoupler GaAlAs Ired & Photo-Diode Array

TLP190B

Telecommunication

Programmable Controllers

MOS Gate Driver

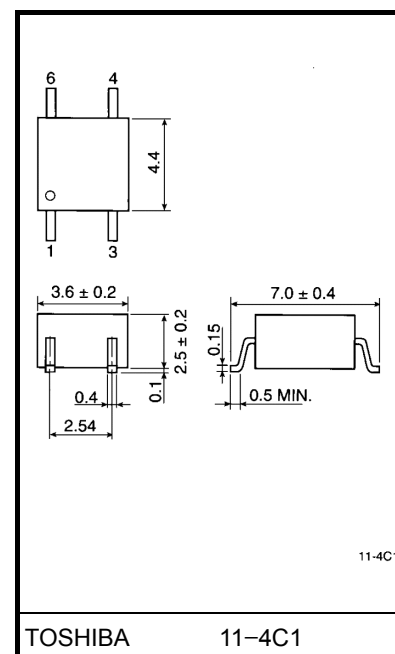
MOS FET Gate Driver

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 μ A (min.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349

Unit in mm

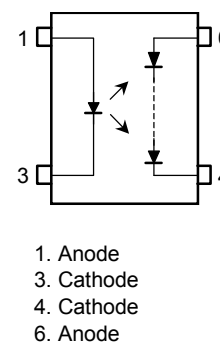


Weight: 0.09 g

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I _F	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F / °C	-0.5	mA / °C
	Pulse forward current (100 μ 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	μ 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. ≤ 60%) (Note)		BV _S	2500	Vrms

Pin Configuration (top view)



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

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.

Individual Electrical Characteristics ($T_a = 25^\circ\text{C}$)

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	μA
	Capacitance	C_T	$V = 0, f = 1\text{ MHz}$	—	30	60	pF
Detector	Forward voltage	V_{FD}	$I_C = 10\text{ }\mu\text{A}$	—	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 ($T_a = 25^\circ\text{C}$)

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	—	μA

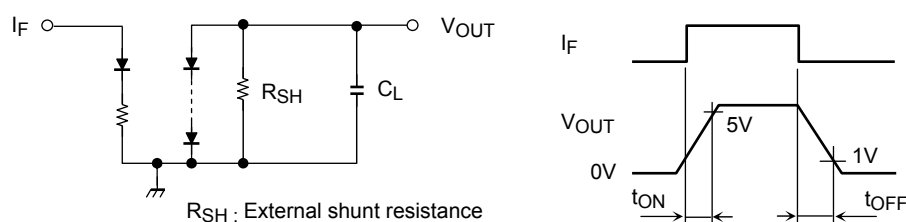
Isolation Characteristics ($T_a = 25^\circ\text{C}$)

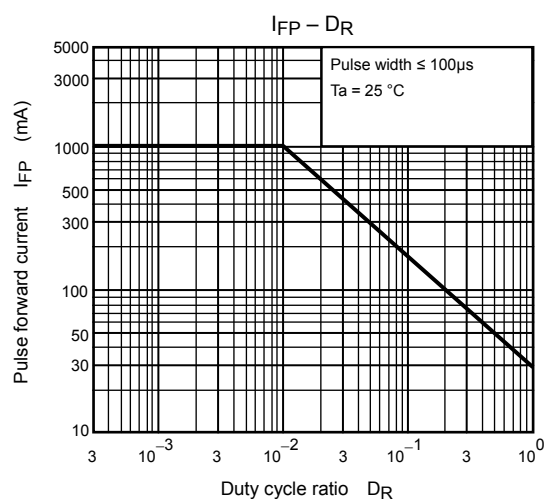
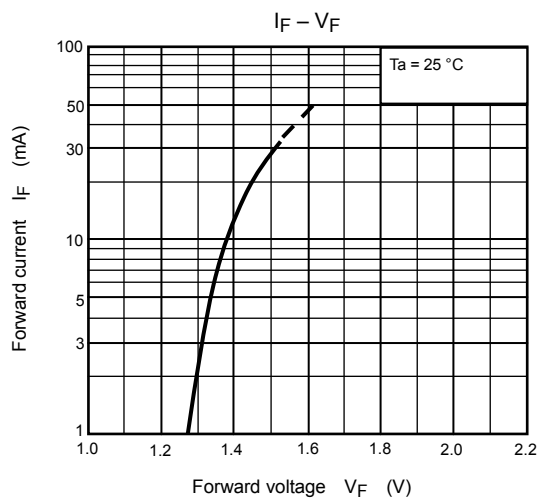
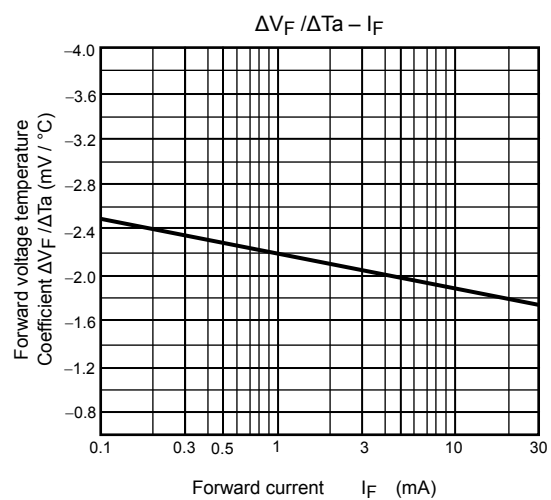
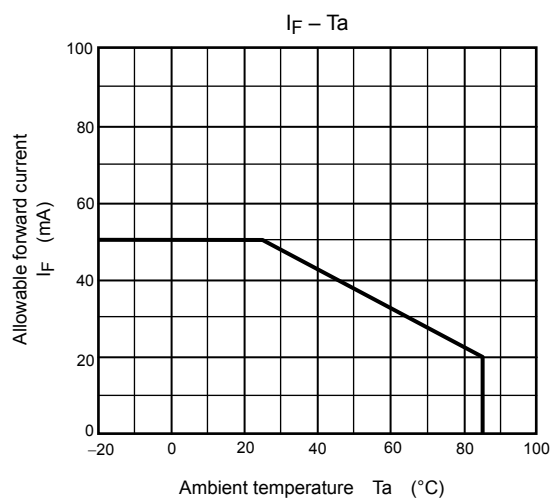
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1\text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500\text{ V}, R.H. \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second in oil	—	5000	—	
		DC,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

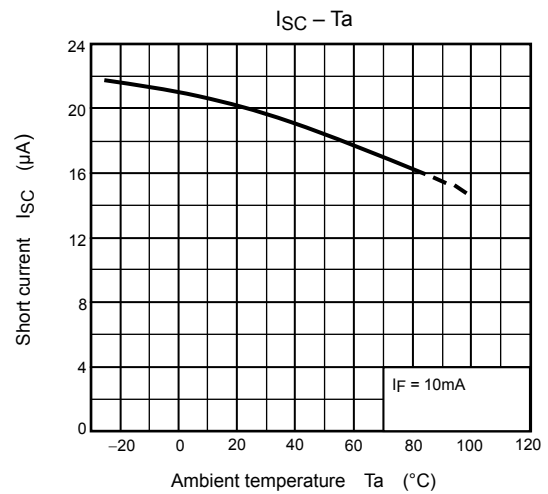
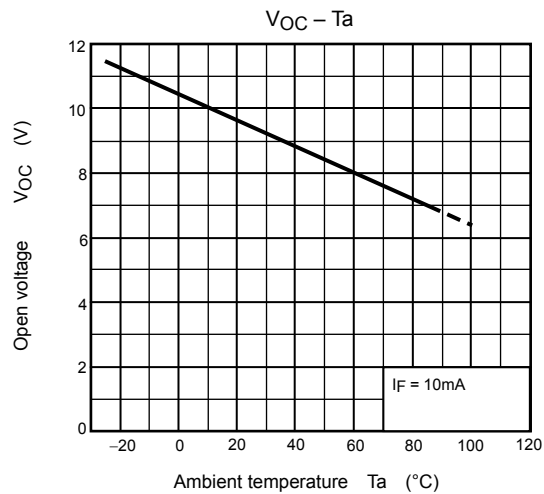
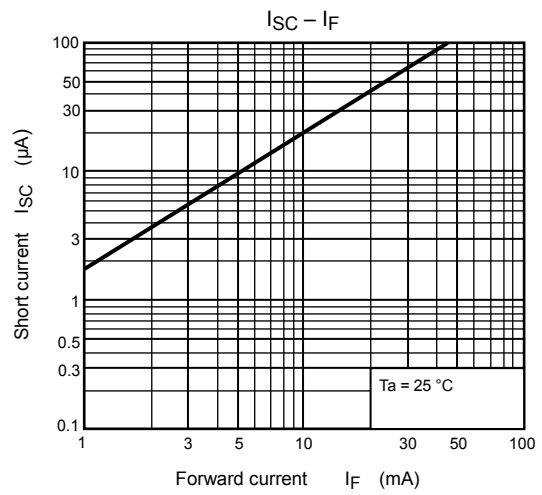
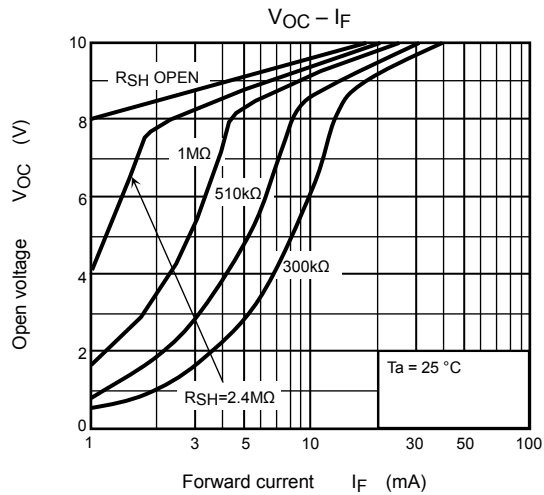
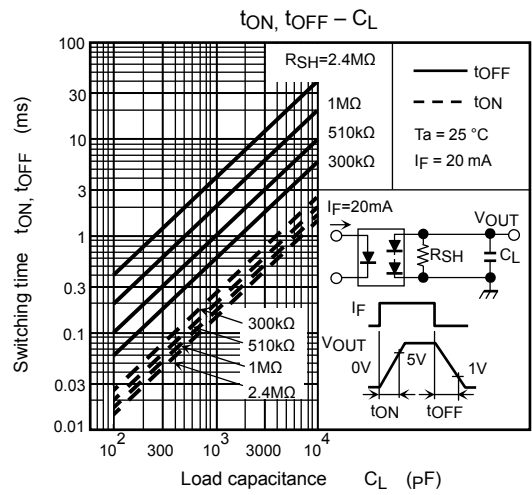
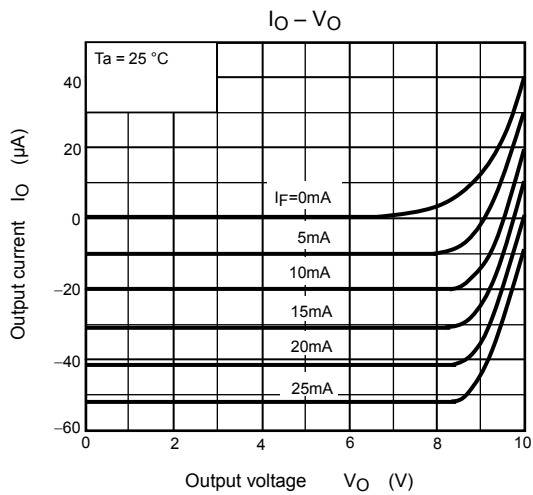
Switching Characteristics ($T_a = 25^\circ\text{C}$)

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

Fig. 1 Switching time test circuit







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20070701-EN

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