Unit in mm

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: 12.0µA (min.)
Isolation voltage: 2500Vrms (min.)
UL recognized: UL1577, file no. E67349

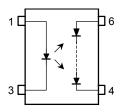
TOSHIBA 11–4C1

Weight: 0.09 g

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
	Forward current	ΙF	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F / °C	-0.5	mA / °C
LED	Pulse forward current (100µs pulse 100pps)	I _{FP}	1	Α
	Reverse voltage	V _R	3	V
	Junction temperature	Tj	125	°C
	Forward current	I _{FD}	50	μΑ
Detector	Reverse voltage	V_{RD}	10	V
	Junction temperature	Tj	125	°C
Storage tem	Storage temperature range		-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)		BVS	2500	Vrms

Pin Configuration (top view)



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

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.	Тур.	Max.	Unit
Forward current	lF	_	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 (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Тур.	Max.	Unit
	Forward voltage	V _F	I _F = 10 mA	1.2	1.4	1.7	V
LED	Reverse current	I _R	V _R = 3 V	1	_	10	μΑ
	Capacitance	C _T	V = 0, f = 1 MHz	_	30	60	pF
	Forward voltage	V _{FD}	I _C = 10 μA	_	7	_	٧
Detector	Reverse current	I _{RD}	V _R = 10 V	_	1	_	nA
	Capacitance (anode to cathode)	C _{TD}	V = 0, f = 1 MHz		_	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	MIn.	Тур.	Max.	Unit
Open voltage	V _{OC}	I _F = 10 mA	7	8	_	V
Short current	I _{SC}	I _F = 10 mA	12	20	_	μΑ

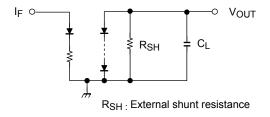
Isolation Characteristics (Ta = 25°C)

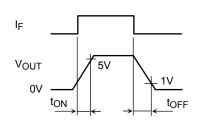
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Capacitance input to output	CS	V _S = 0, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5×10 ¹⁰	10 ¹⁴	_	Ω
Isolation voltage	BVS	AC, 1 minute	2500	_	_	Vrms
		AC, 1 second in oil	_	5000	_	VIIIIS
		DC, 1 minute in oil	_	5000	_	Vdc

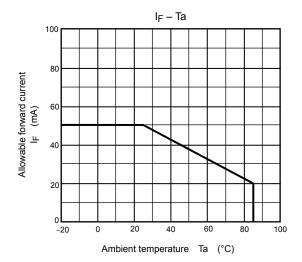
Switching Characteristics (Ta = 25°C)

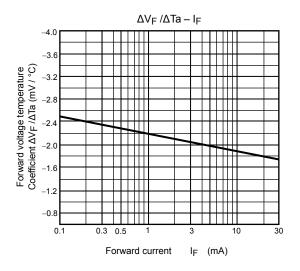
Characteristic	Symbol	Test Condition		Min.	Тур.	Max.	Unit
Turn-on time	ton	I_F = 20 mA, R_{SH} = 510 kΩ		_	0.2	_	ms
Turn-off time	toff	C _L = 1000pF	(Fig. 1)	-	1	-	ms

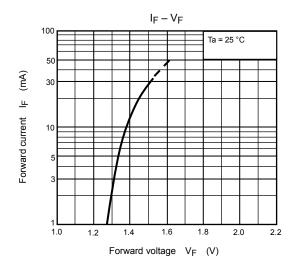
Fig. 1 Switching time test circuit

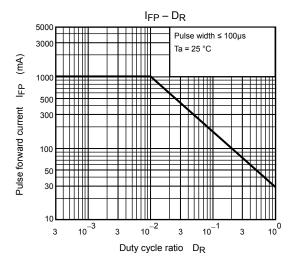


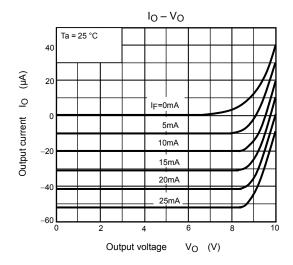


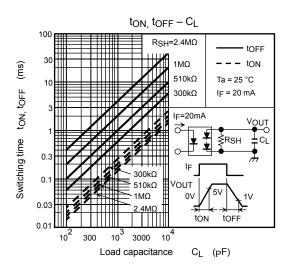


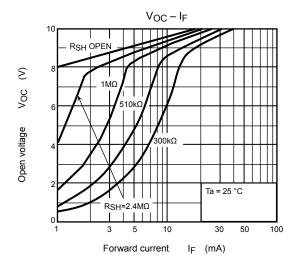


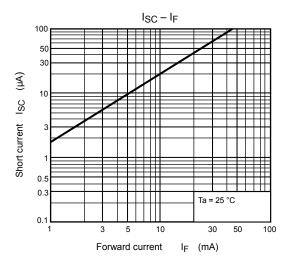


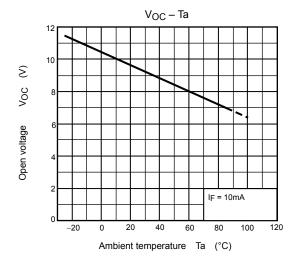


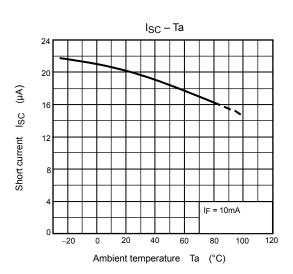












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