TOSHIBA Photocoupler GaA{As Ired & Photo-Diode Array

TLP590B

Telecommunications Programmable Controllers MOS Gate Drivers MOSFET Gate Drivers

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. The TLP590B is suitable for MOSFET gate drivers.

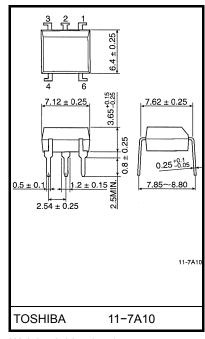
• UL recognized: UL1577, file No. E67349

Short Current

Type Name	Classification	Short Current		Classification
Name	Classification	(min)	١ _F	Marking
TLP590B	C20	20 µA	10 mA	20
ILP090B	Standard	12 µA		20, blank

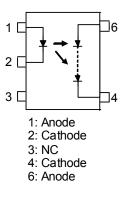
Note: When applying for a safety standard approval, use the type name of the standard device.

TLP590B(C20): TLP590B



Weight: 0.39 g (typ.)

Pin Configuration (Top View)



Unit: mm

Absolute Maximum Ratings (Ta = 25°C)

	Characteristics	Symbol	Rating	Unit
	Forward current	١ _F	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F / °C	-0.5	mA / °C
LED	Pulse forward current (100 µs pulse, 100 pps)	IFP	1	А
	Reverse voltage	V _R	3	V
	Junction temperature	Tj	125	°C
or	Forward current	I _{FD}	50	μA
Detector	Reverse voltage	V _{RD}	10	V
ă	Junction temperature	Tj	125	°C
Stor	rage temperature range	T _{stg}	–55 to 125	°C
Ope	erating temperature range	T _{opr}	-40 to 85	°C
	d soldering temperature sec.)	T _{sol}	260	°C
	ation voltage , 1 min., 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.

Recommended Operating Conditions

Characteristic	Symbol	Min	Тур.	Max	Unit
Forward current	١ _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 (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
	Forward voltage	VF	I _F = 10 mA	1.2	1.4	1.7	V
LED	Reverse current	I _R	V _R = 3 V			10	μA
	Capacitance	CT	V = 0, f = 1 MHz	_	30	60	pF
ector	Forward voltage	V _{FD}	I _{FD} = 10 μA	_	7	_	V
Detector	Reverse current	I _{RD}	V _{RD} = 10 V	_	1	_	nA

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Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Open voltage	V _{OC}	I _F = 10 mA	7.0	8.0	_	V
Short current	I _{SC}	I _F = 10 mA	12	20		μA

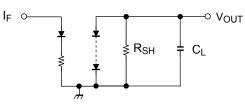
Isolation Characteristics (Ta = 25°C)

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
		AC, 1 minute 2500 —		_	_	Vrms
Isolation voltage	BVS	AC, 1 second in oil	_	5000	_	VIIIS
		DC, 1 minute in oil	—	5000		Vdc

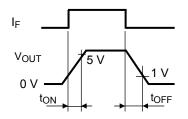
Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time	t _{ON}	I _F = 20 mA, R _{SH} = 510 kΩ	—	0.2	_	ms
Turn-off time	tOFF	C _L =1000 pF (Fig.) _	1	_	ms

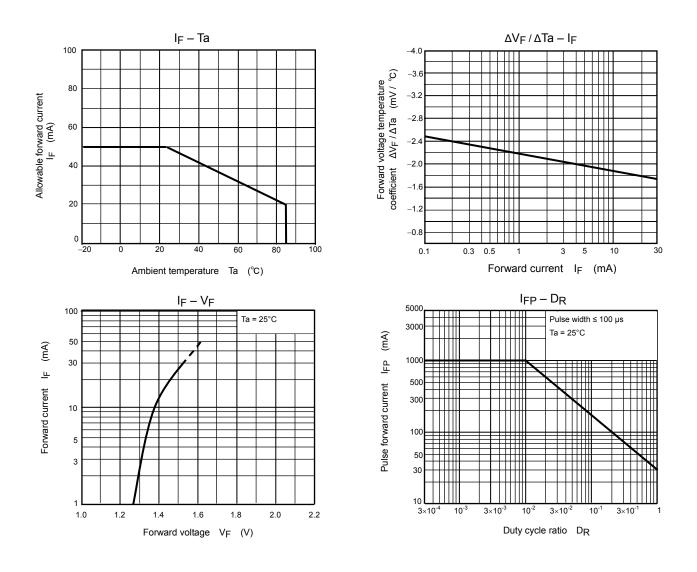
Fig. 1: Switching time test circuit



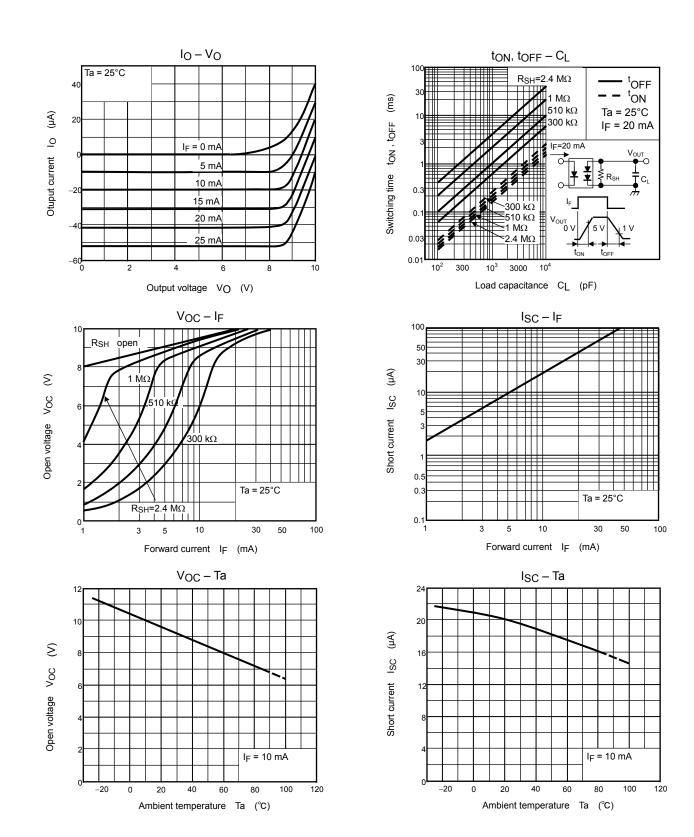
R_{SH}: External shunt resistance



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