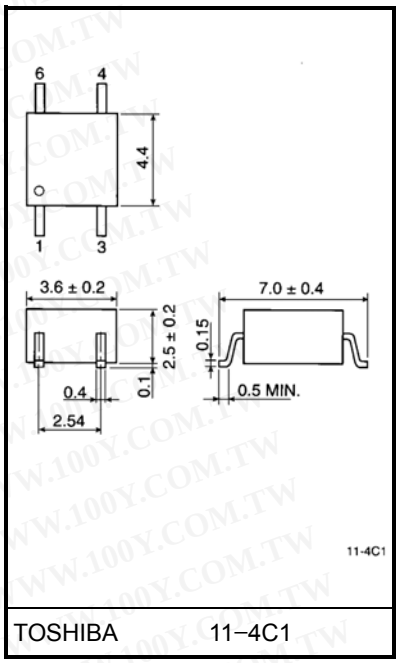
TOSHIBA Photocoupler GaAℓAs Ired & Photo−Diode Array

TLP190B

Telecommunication
Programmable Controllers
MOS Gate Driver
MOS FET Gate Driver

Unit in mm



TOSHIBA 11−4C1

Weight: 0.09 g

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.

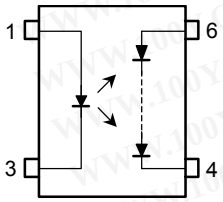
- Open voltage: 7.0V (min.)
- Short current: 12.0μA (min.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349

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 (100μs pulse 100pps)	I_{FP}	1	A
	Reverse voltage	V_R	3	V
	Junction temperature	T_j	125	°C
Detector	Forward current	I_{FD}	50	μA
	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

(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 mA	1.2	1.4	1.7	V
	Reverse current	I_R	V_R = 3 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	60	pF
Detector	Forward voltage	V_{FD}	I_C = 10 μA	—	7	—	V
	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.	Typ.	Max.	Unit
Open voltage	V_{OC}	I_F = 10 mA	7	8	—	V
Short current	I_{SC}	I_F = 10 mA	12	20	—	μA

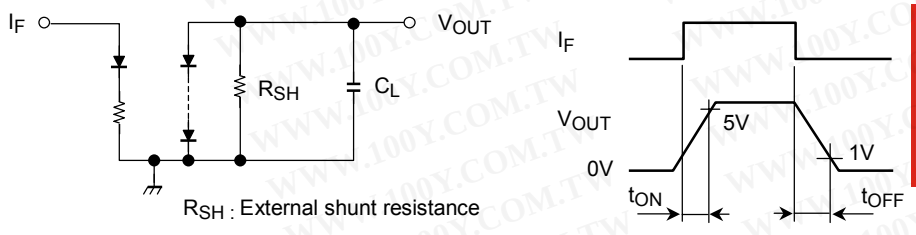
Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	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	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second in oil	—	5000	—	
		DC, 1 minute in oil	—	5000	—	Vdc

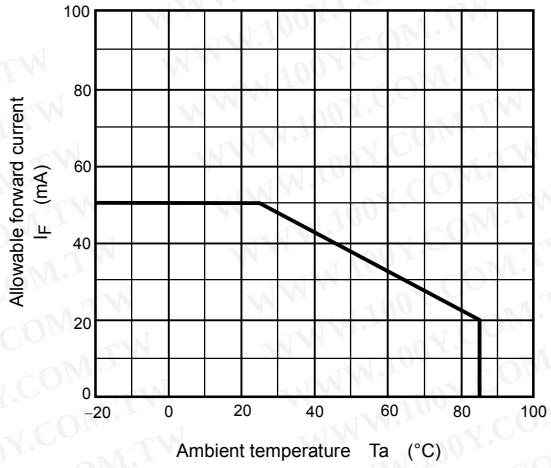
Switching Characteristics (Ta = 25°C)

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

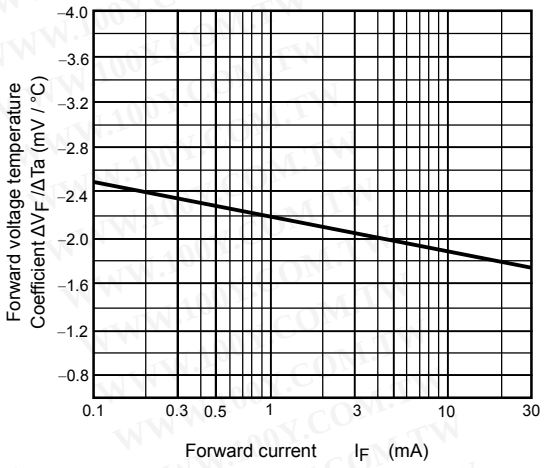
Fig. 1 Switching time test circuit



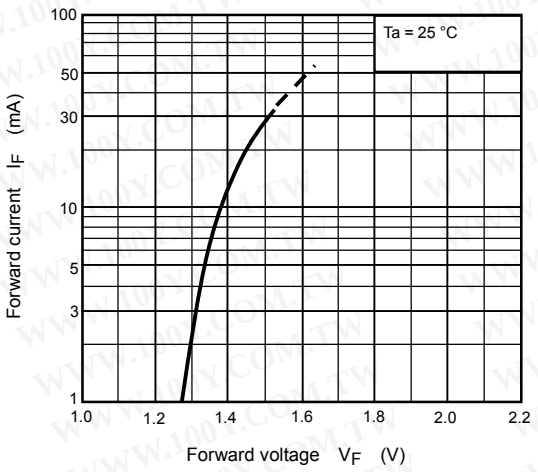
I_F – Ta



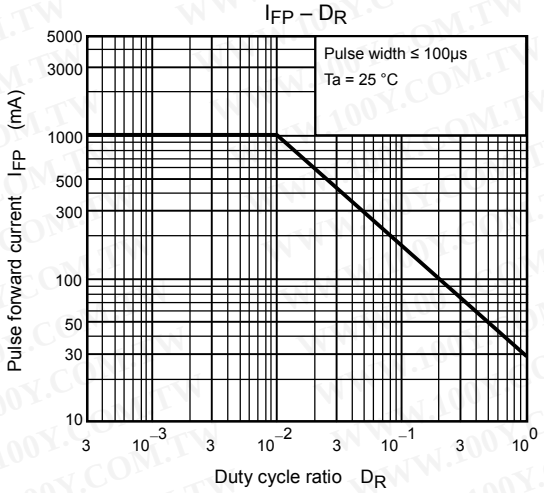
$\Delta V_F / \Delta Ta$ – I_F



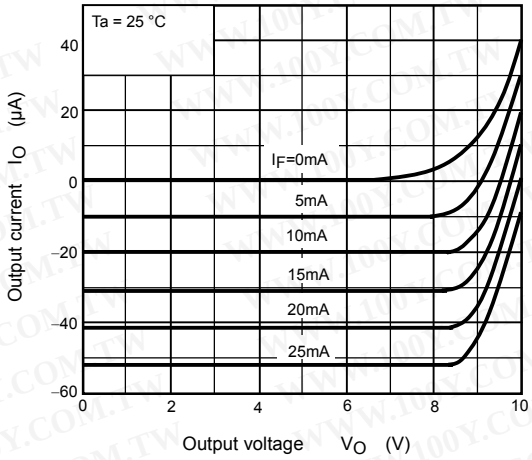
I_F – V_F



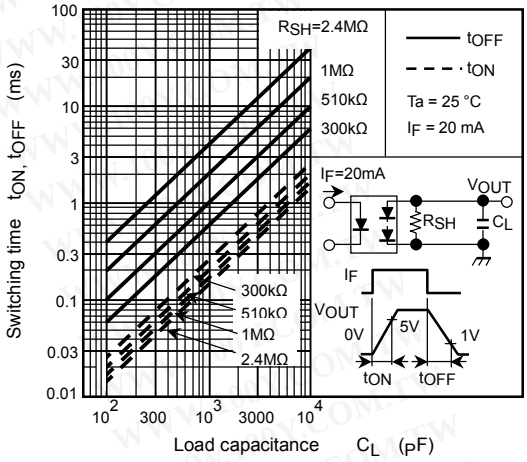
I_{FP} – D_R



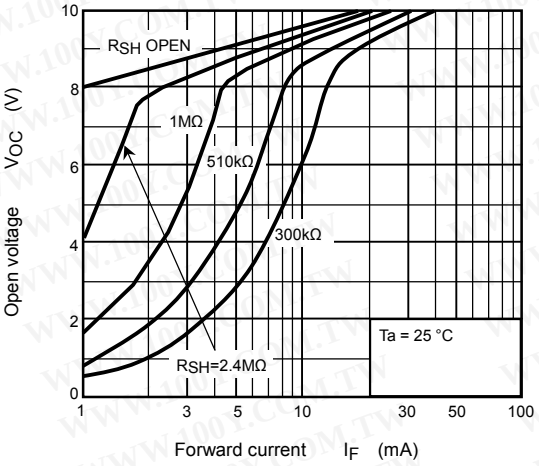
$I_O - V_O$



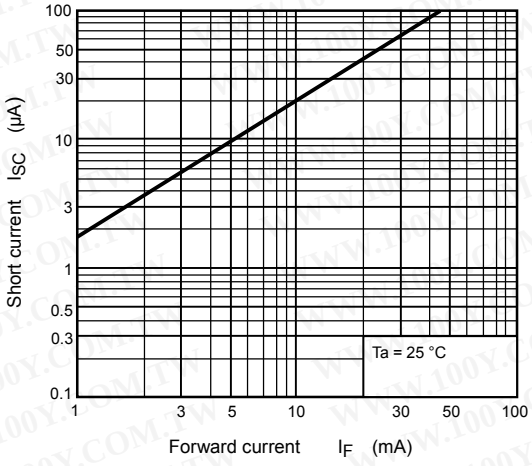
$t_{ON}, t_{OFF} - C_L$



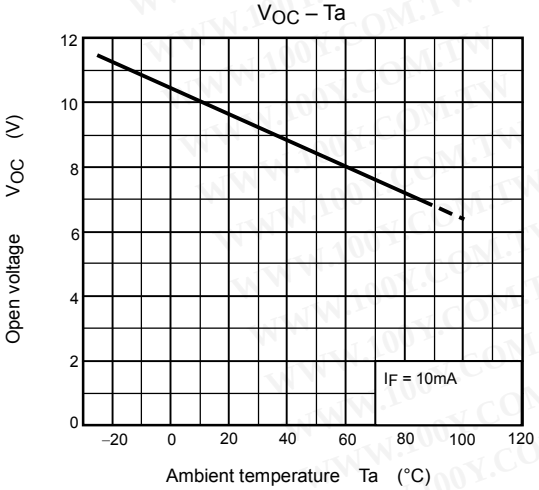
$V_{OC} - I_F$



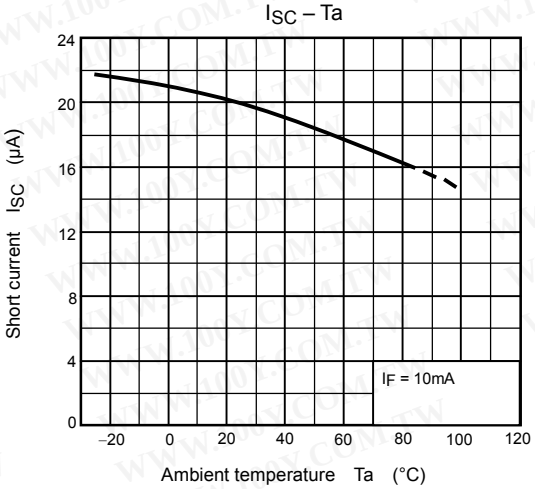
$I_{SC} - I_F$



$V_{OC} - Ta$



$I_{SC} - Ta$



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