

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.

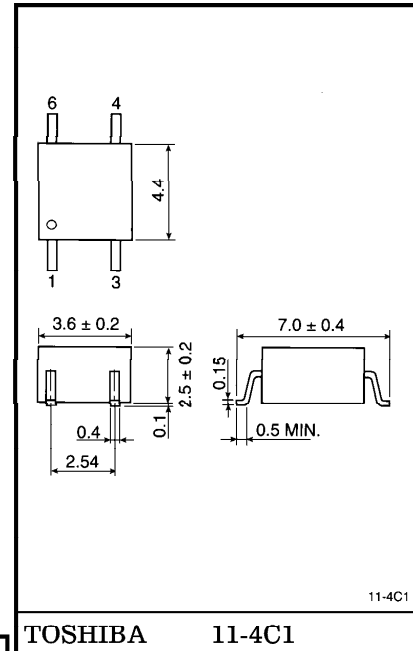
- Open Voltage : 7.0V (MIN.)
- Short Current : 12.0 μ A (MIN.)
- Isolation Voltage : 2500Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F	50	mA
	Forward Current Derating (Ta \geq 25°C)	$\Delta I_F / ^\circ C$	-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 (10s)		T _{sol}	260	°C
Isolation Voltage (AC, 1 min., R.H. \leq 60%) (Note)		BV _S	2500	Vrms

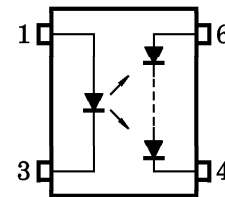
(Note) Device considered a two terminal device : Pins 1 and 3 shorted together and Pins 4 and 6 shorted together.

Unit in mm



Weight : 0.09g

PIN CONFIGURATION (TOP VIEW)



1. ANODE
3. CATHODE
4. CATHODE
6. ANODE

961001EBC2

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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	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	60	pF
DETECTOR	Forward Voltage	V_{FD}	$I_F = 10\mu\text{A}$	—	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	—	μA

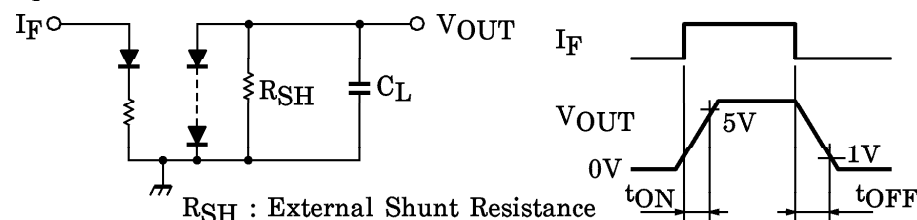
ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	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)

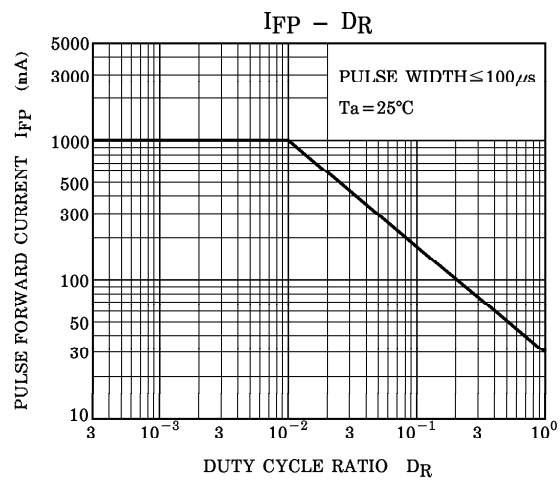
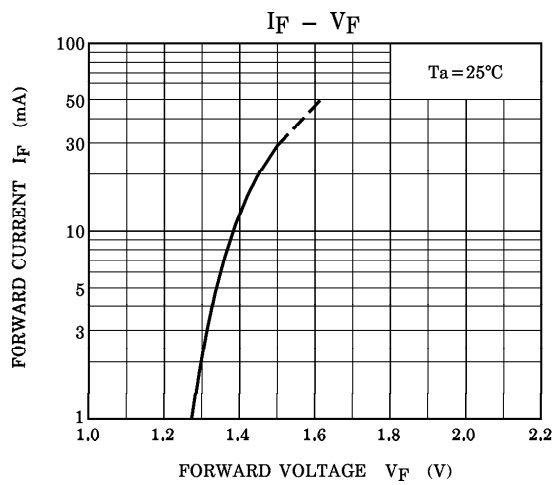
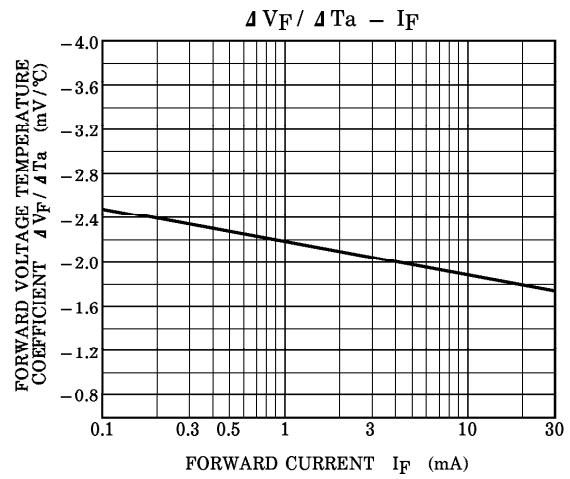
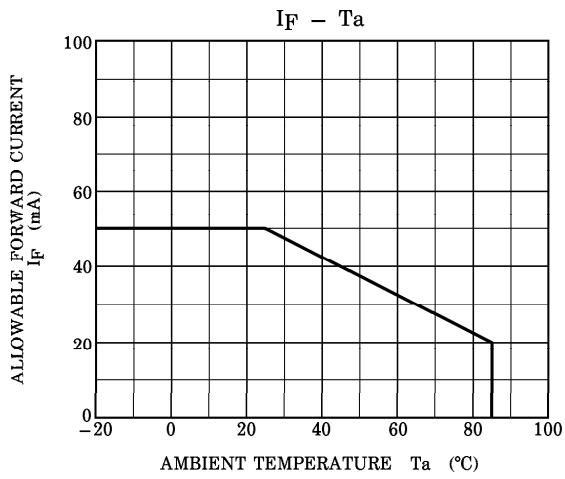
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	$I_F = 20\text{mA}, R_{SH} = 510\text{k}\Omega$	—	0.2	—	ms
Turn-off Time	t_{OFF}	$C_L = 1000\text{pF}$ (Fig.1)	—	1	—	ms

Fig.1 SWITCHING TIME TEST CIRCUIT

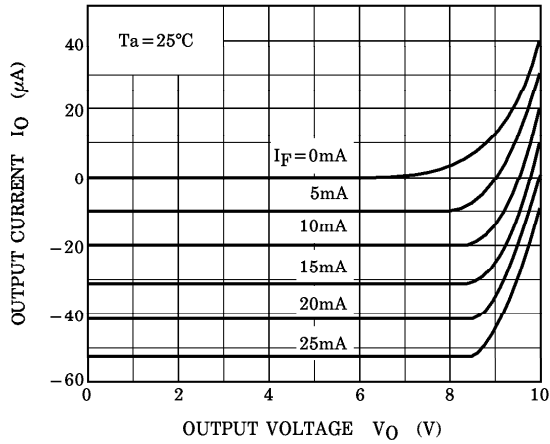


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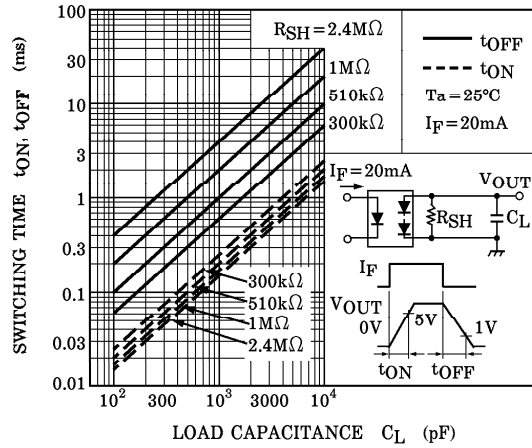
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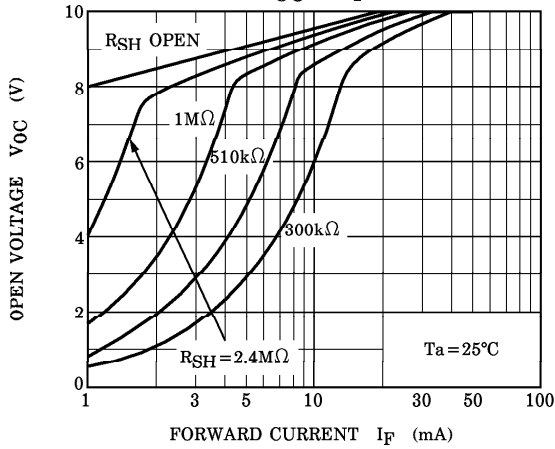
$I_O - V_O$



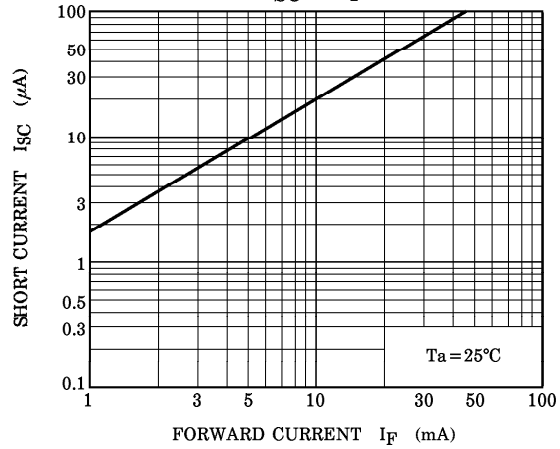
$t_{ON}, t_{OFF} - C_L$



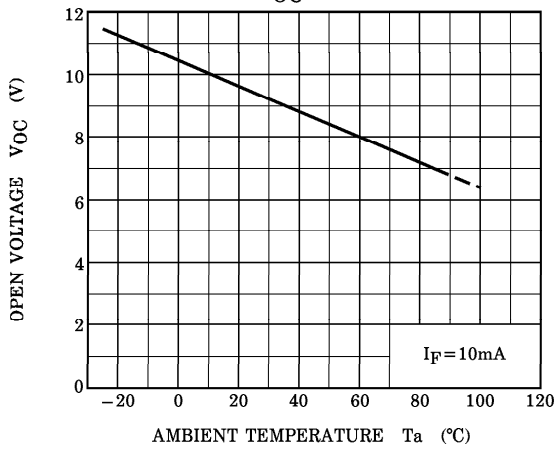
$V_{OC} - I_F$



$I_{SC} - I_F$



$V_{OC} - T_a$



$I_{SC} - T_a$

