

# TLP3131

MEASUREMENT INSTRUMENTS  
 LOGIC IC TESTERS / MEMORY TESTERS  
 BOARD TESTERS / SCANNERS

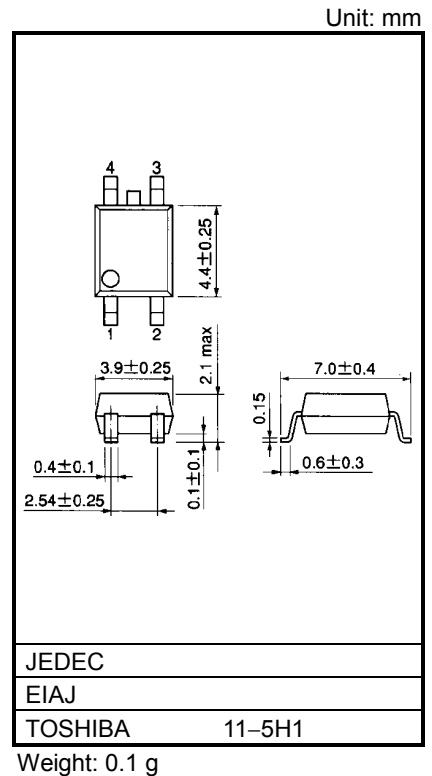
The TOSHIBA TLP3131 Mini-flat photorelay is a small-outline photorelay, suitable for surface-mount assembly. The TLP3131 consists of a GaAs infrared-emitting diode optically coupled to a photo-MOS FET and housed in a 4-pin package.

The TLP3131 features low CR multiplication and especially low On-state resistance, allowing high ON-state current.

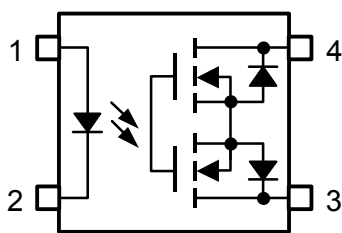
Its characteristics also include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency measuring instruments.

## FEATURES

- 4 pin SOP (2.54SOP4) : 2.1 mm high, 2.54 mm pitch
- 1-Form-A
- Peak Off-State Voltage : 20 V (MIN.)
- Trigger LED Current : 4 mA (MAX.)
- On-State Current : 300 mA (MAX.)
- On-State Resistance : 1.5 Ω (MAX.), 1.0 Ω (TYP.)
- Output Capacitance : 12.0 pF (MAX.), 5.0 pF (TYP.)
- Isolation Voltage : 1500 Vrms (MIN.)

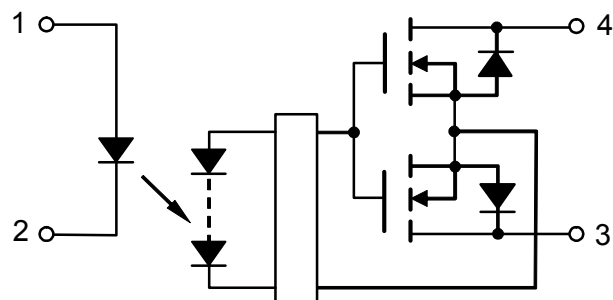


## PIN CONFIGURATION (TOP VIEW)



1 : ANODE  
 2 : CATHODE  
 3 : DRAIN  
 4 : DRAIN

## SCHEMATIC



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 25°C)	ΔI <sub>F</sub> /°C	-0.5	mA/°C
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Terminal Voltage	V <sub>OFF</sub>	20	V
	On-State Current	I <sub>ON</sub>	300	mA
	On-State Current Derating (Ta ≥ 25°C)	ΔI <sub>ON</sub> /°C	-3.0	mA/°C
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature Range		T <sub>stg</sub>	-40~125	°C
Operating Temperature Range		T <sub>opr</sub>	-20~85	°C
Lead Soldering Temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		BV <sub>S</sub>	1500	Vrms

(NOTE1) : Device considered a two-terminal device : Pins 1 and, 2 shorted together, and pins 3 and 4 shorted together.

**CAUTION**

This device is sensitive to electrostatic discharge. When using this device, please ensure that all tools and equipment are earthed.

**RECOMMENDED OPERATING CONDITIONS**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>DD</sub>	—	—	20	V
Forward Current	I <sub>F</sub>	10	—	30	mA
On-State Current	I <sub>ON</sub>	—	—	300	mA
Operating Temperature	T <sub>opr</sub>	25	—	60	°C

**INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	—	15	—	pF
DETECTOR	Off-State Current	I <sub>OFF</sub>	V <sub>OFF</sub> = 20 V, Ta = 50°C	—	—	1000	pA
	Capacitance	C <sub>OFF</sub>	V = 0, f = 100 MHz, t < 1 s	—	5.0	12.0	pF

**COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$I_{ON} = 100 \text{ mA}$	—	—	4	mA
Return LED Current	$I_{FC}$	$I_{OFF} = 10 \text{ } \mu\text{A}$	0.2	0.75	—	mA
On-State Resistance	$R_{ON}$	$I_{ON} = 100 \text{ mA}, I_F = 5 \text{ mA}, t < 1 \text{ s}$	—	1	1.5	$\Omega$

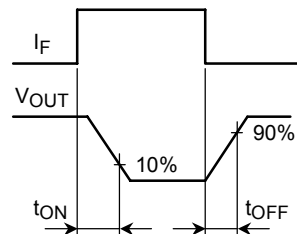
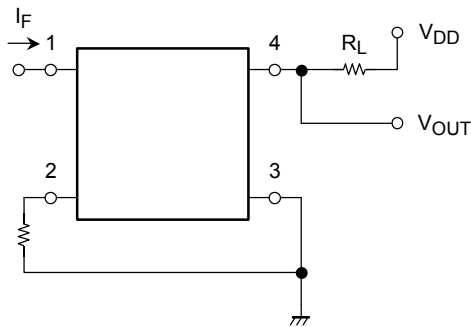
**ISOLATION CHARACTERISTICS (Ta = 25°C)**

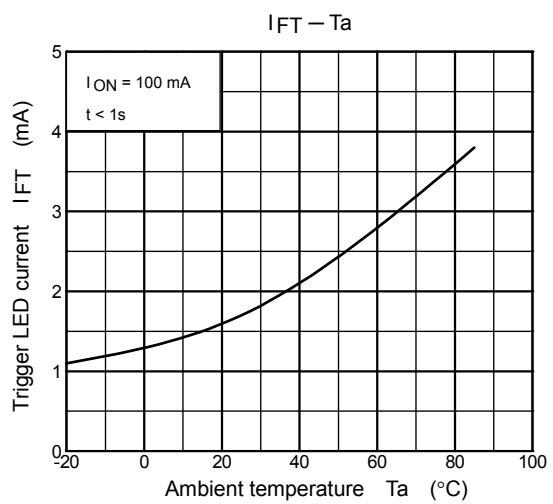
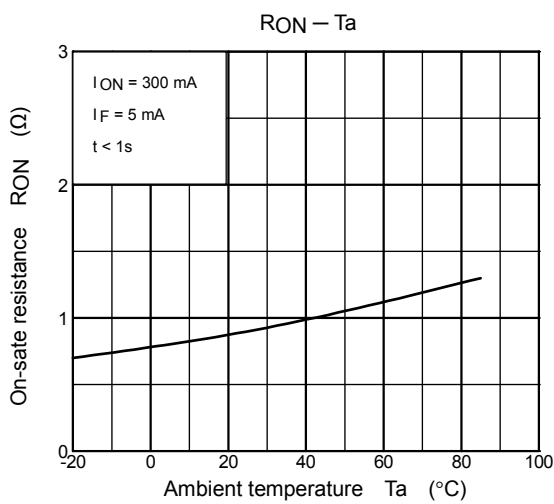
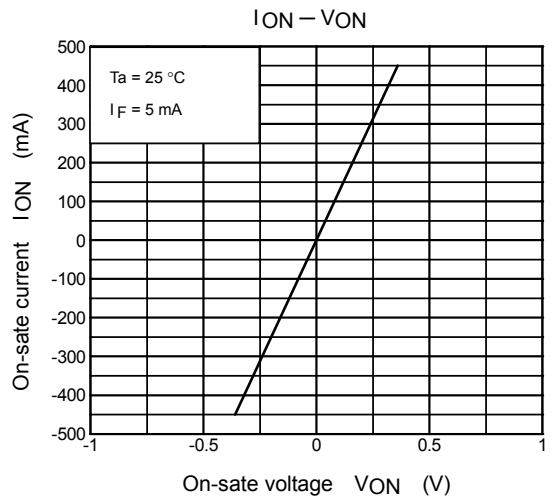
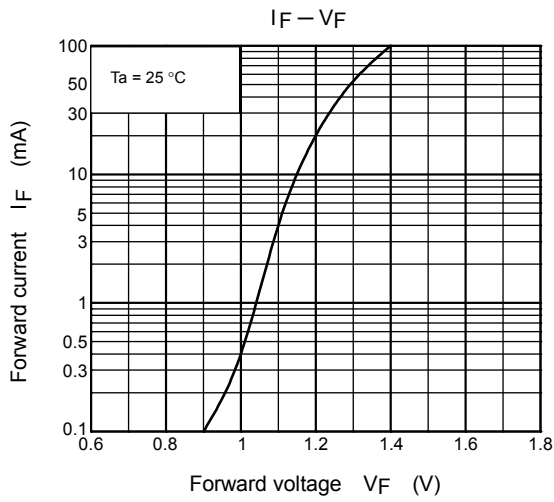
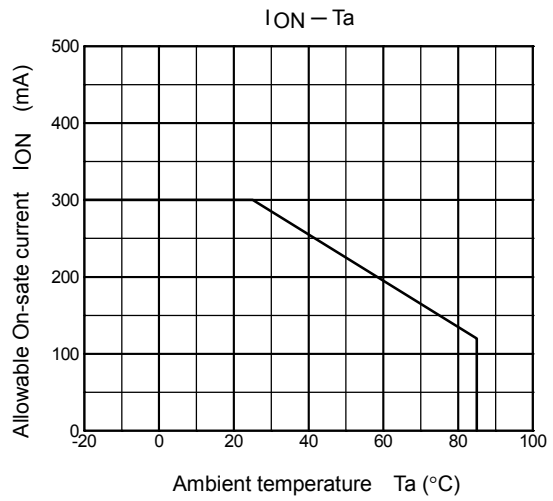
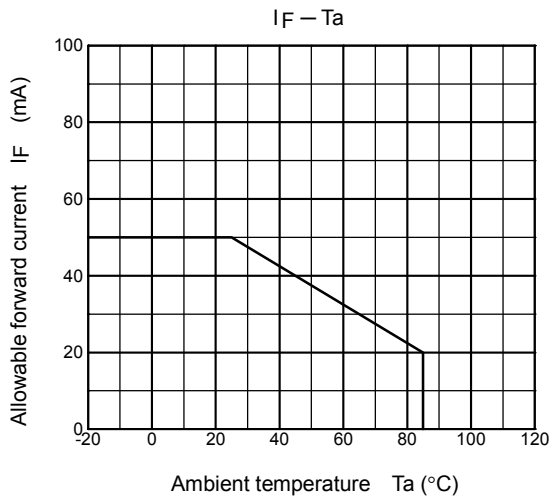
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	—
		DC, 1 minute (in oil)	—	3000	—	Vdc

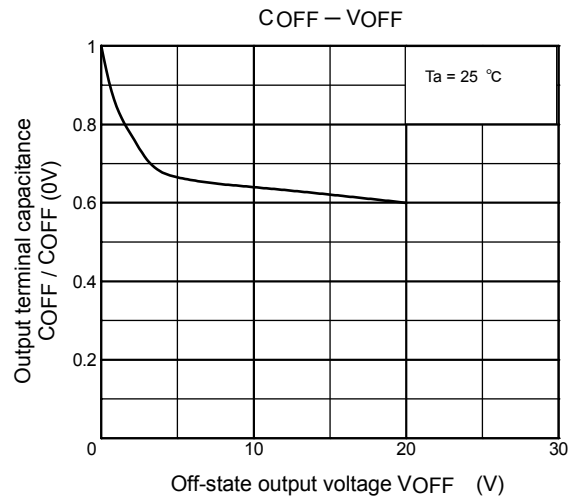
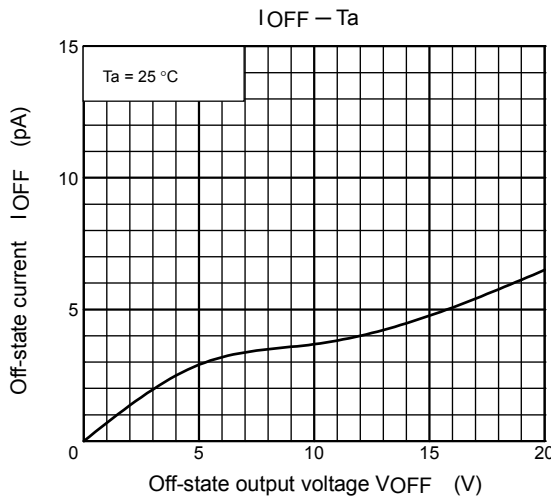
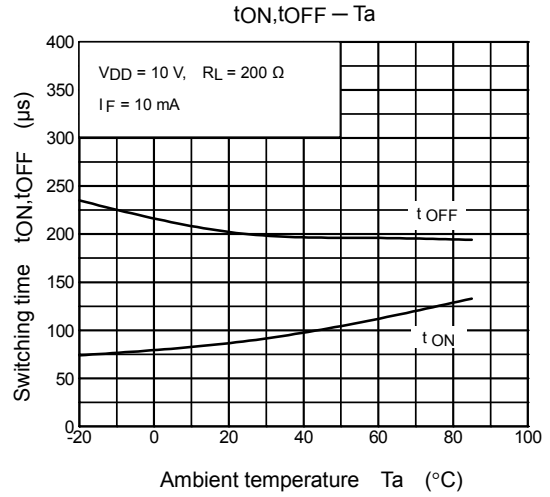
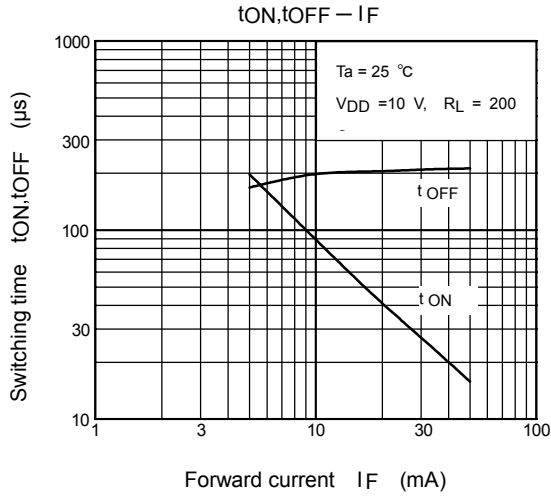
**SWITCHING CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	$t_{ON}$	$R_L = 200 \text{ } \Omega$ (NOTE 2) $V_{DD} = 10 \text{ V}, I_F = 10 \text{ mA}$	—	—	500	$\mu\text{s}$
Turn-off Time	$t_{OFF}$		—	—	500	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT







**RESTRICTIONS ON PRODUCT USE**

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