

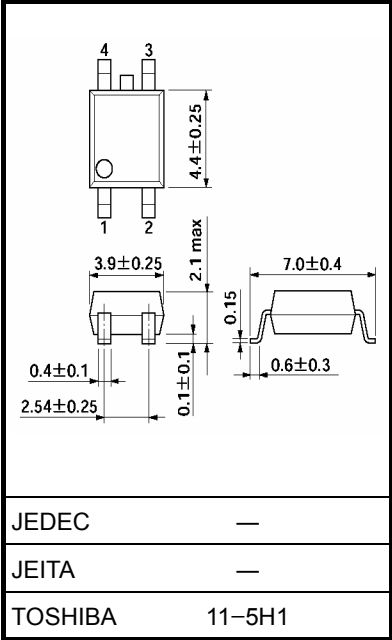
TLP3111

Measurement Instruments
Logic IC Testers / Memory Testers
Board Testers / Scanners

The TOSHIBA mini flat photo relay TLP3111 is a small outline photo relay, suitable for surface mount assembly.
The TLP3111 consists of a GaAs infrared emitting diode optically coupled to a photo-MOSFET in a 4 pin lead package, and has characteristics of small off-state current and small output terminal capacitance, which enable the TLP3111 to be applied to measurement instruments.(especially to high-frequency measurements)

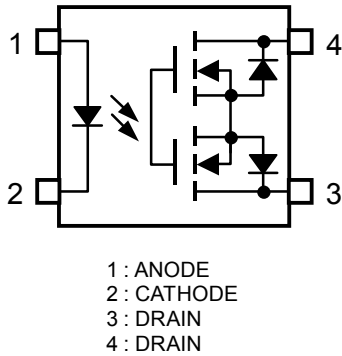
- 1-form-A
- Peak off-state voltage: 80 V (min)
- Trigger LED current: 4 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 20 Ω (max)
- Isolation voltage: 1500 V_{rms} (min)
- UL recognized: UL1577, file No. E67349

Unit: mm

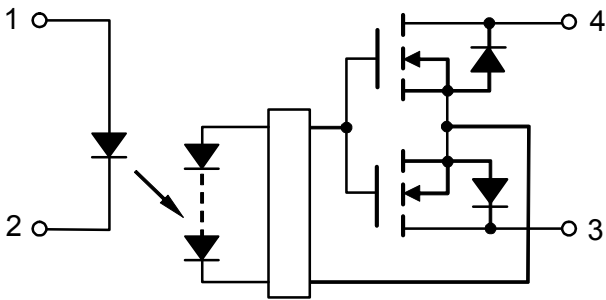


Weight: 0.1 g (typ.)

Pin Configuration (top view)



Schematic



Start of commercial production
1997/09

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C
	Reverse voltage	V_R	6	V
	Junction temperature	T_j	125	°C
Detector	Off-state output voltage	V_{OFF}	80	V
	On-state current	I_{ON}	100	mA
	On-State Current Derating (Ta ≥ 25°C)	$\Delta I_{ON}/^\circ\text{C}$	-1.0	mA/°C
	Junction temperature	T_j	125	°C
Storage temperature		T_{stg}	-40 to 125	°C
Operating temperature		T_{opr}	-20 to 85	°C
Soldering temperature (10 s)		T_{sol}	260	°C
Isolation voltage (AC, 1 minute, R.H. ≤ 60%) (Note 1)		B_{VS}	1500	V_{rms}

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 and 2 shorted together, and pins 3 and 4 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{OFF}	—	—	64	V
Forward current	I_F	10	—	30	mA
On-state current	I_{ON}	—	—	100	mA
Operating temperature	T_{opr}	-20	—	65	°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	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 20 \text{ mA}$	1.0	1.2	1.4	V
	Reverse voltage	I_R	$V_R = 6 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	15	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 30 \text{ V}, T_a = 50^\circ\text{C}$	—	0.05	1	nA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	11	15	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
On-state resistance	R_{ON}	$I_{ON} = 100 \text{ mA}$, $I_F = 5 \text{ mA}$	—	12	20	Ω
Return LED Current	I_{FC}	$I_{OFF} = 10 \mu\text{A}$	0.2	—	—	mA

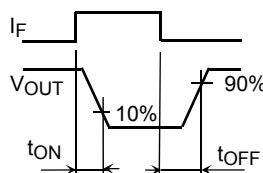
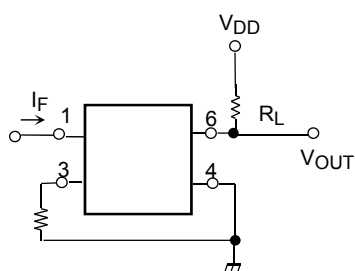
Isolation Characteristics (Ta = 25°C)

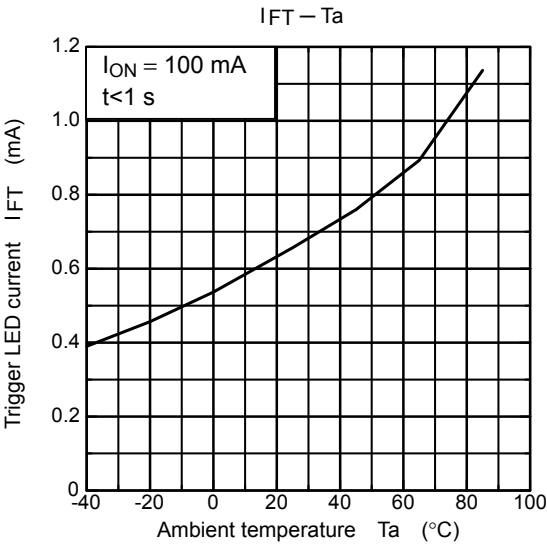
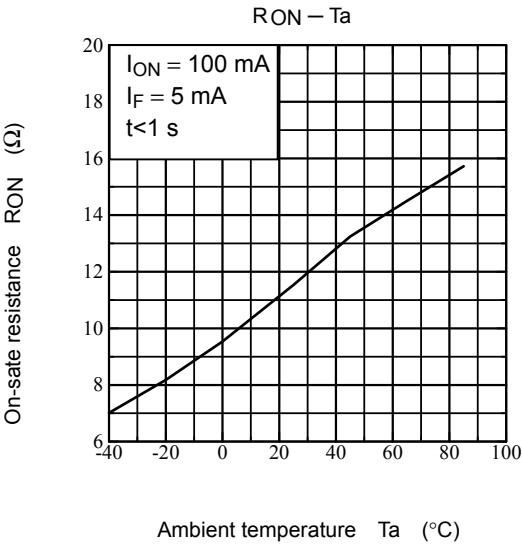
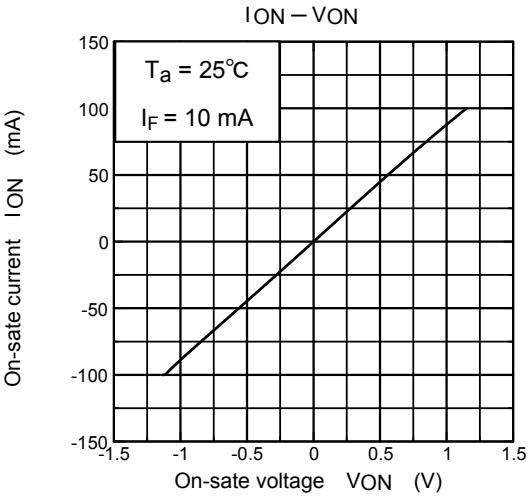
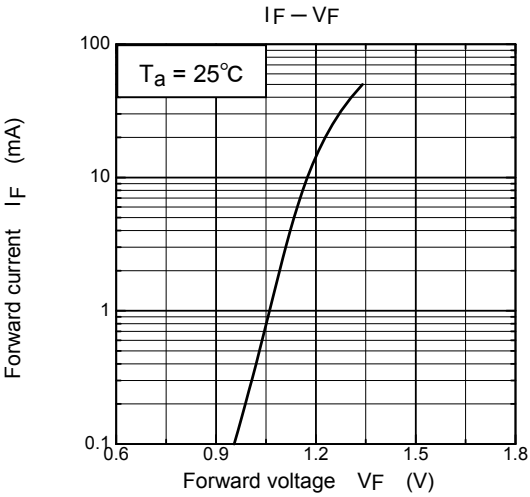
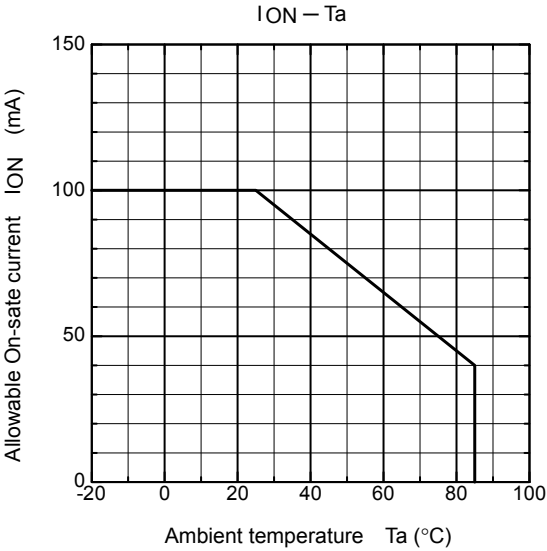
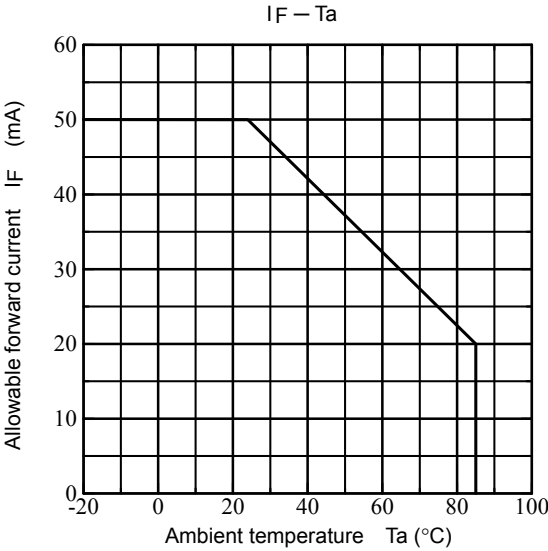
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0 \text{ V}$, $f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}$, R.H. $\leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	B_{VS}	AC, 1 minute	1500	—	—	V_{rms}
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—	3000	—	V_{dc}

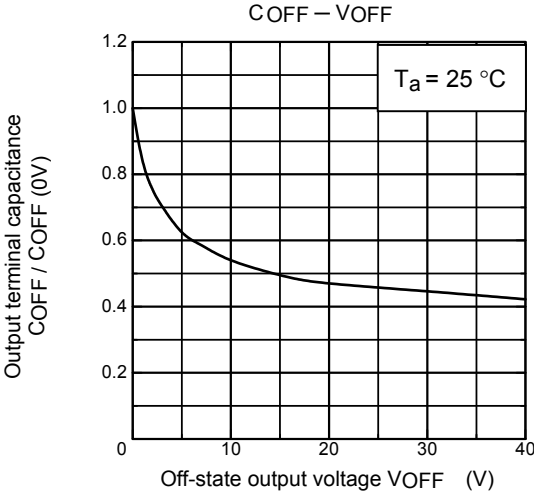
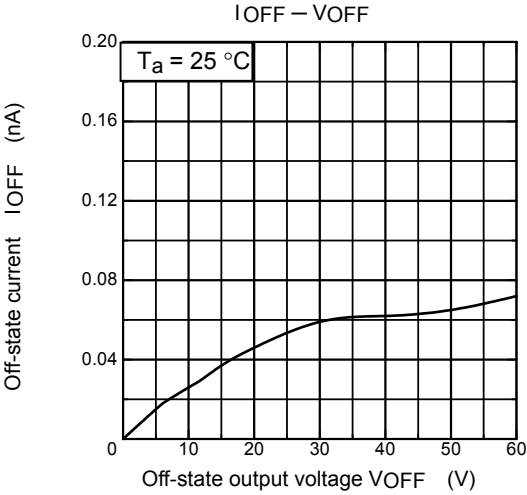
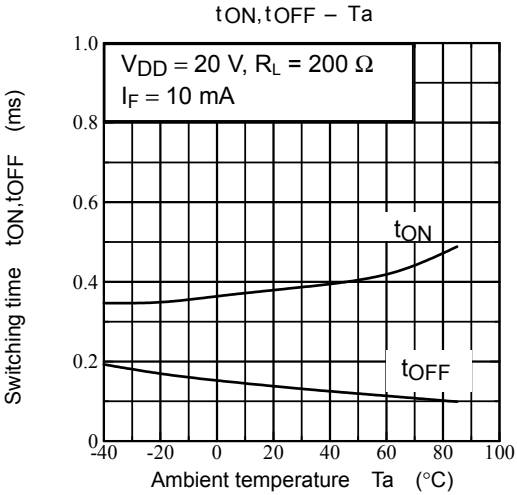
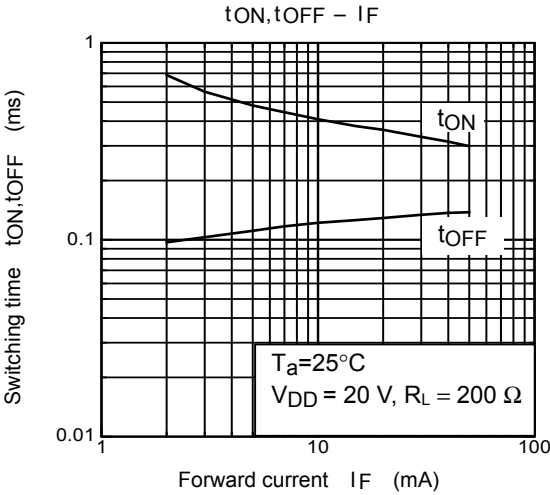
Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}$, $I_F = 10 \text{ mA}$ (Note2)	—	—	1	ms
Turn-off time	t_{OFF}		—	—	1	

(Note2): Switching time test circuit







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