

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP3113

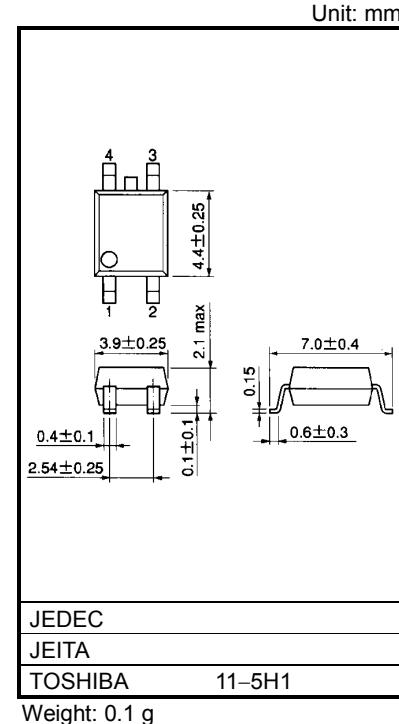
MEASUREMENT INSTRUMENTS
 LOGIC IC TESTERS / MEMORY TESTERS
 BOARD TESTERS / SCANNERS

The TOSHIBA TLP3113 Mini-flat photorelay is a small-outline photorelay, suitable for surface-mount assembly. The TLP3113 consists of a GaAs infrared-emitting diode optically coupled to a photo-MOS FET and housed in a 4-pin package.

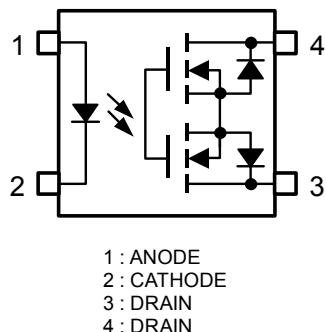
Its characteristics include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency measuring instruments.

FEATURES

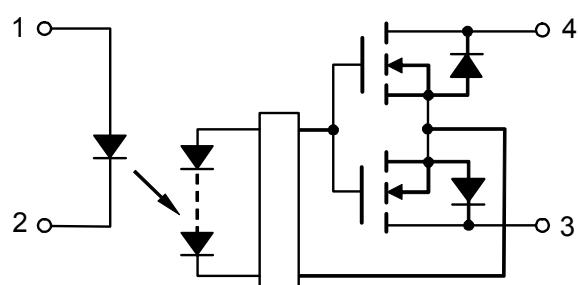
- 4 pin SOP (2.54SOP4) : 2.1 mm high, 2.54 mm pitch
- 1-Form-A
- Peak Off-State Voltage : 40 V (MIN.)
- Trigger LED Current : 4 mA (MAX.)
- On-State Current : 80 mA (MAX.)
- On-State Resistance : 35 Ω (MAX.), 25 Ω (TYP.)
- Output Capacitance : 1.4 pF (MAX.), 0.6 pF (TYP.)
- Isolation Voltage : 1500 Vrms (MIN.)



PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



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
	Reverse Voltage	V _R	5		V
	Junction Temperature	T _j	125		°C
DETECTOR	Off-State Output Terminal Voltage	V _{OFF}	40		V
	On-State Current	I _{ON}	80		mA
	On-State Current Derating (Ta ≥ 25°C)	ΔI _{ON} /°C	-0.8		mA/°C
	Junction Temperature	T _j	125		°C
Storage Temperature Range		T _{stg}	-40~125		°C
Operating Temperature Range		T _{opr}	-20~85		°C
Lead Soldering Temperature (10 s)		T _{sol}	260		°C
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		BV _S	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 _{DD}	—	—	32	V
Forward Current	I _F	10	—	30	mA
On-State Current	I _{ON}	—	—	80	mA
Operating Temperature	T _{opr}	25	—	60	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F = 10 mA		1.0	1.15	1.3	V
	Reverse Current	I _R	V _R = 5 V		—	—	10	μA
	Capacitance	C _T	V = 0, f = 1 MHz		—	15	—	pF
DETECTOR	Off-State Current	I _{OFF}	V _{OFF} = 30 V, Ta = 50°C		—	—	1000	pA
	Capacitance	C _{OFF}	V = 0, f = 100 MHz, t < 1 s		—	0.6	1.4	pF

COUPLED ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	$I_{ON} = 80 \text{ mA}$	—	—	4	mA
Return LED Current	I_{FC}	$I_{OFF} = 10 \mu\text{A}$	0.2	0.75	—	mA
On-State Resistance	R_{ON}	$I_{ON} = 80 \text{ mA}, I_F = 5 \text{ mA}, t < 1 \text{ s}$	—	25	35	Ω

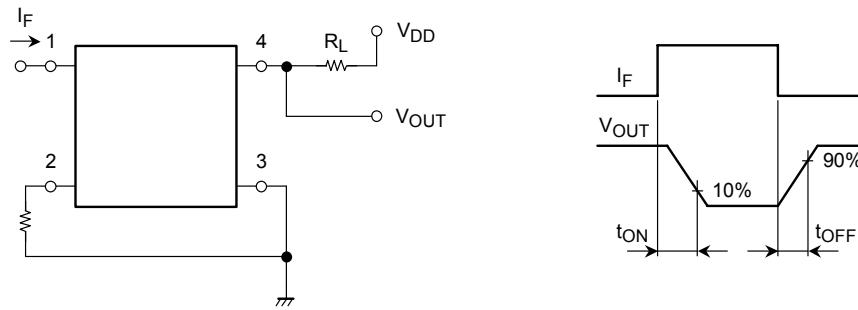
ISOLATION CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

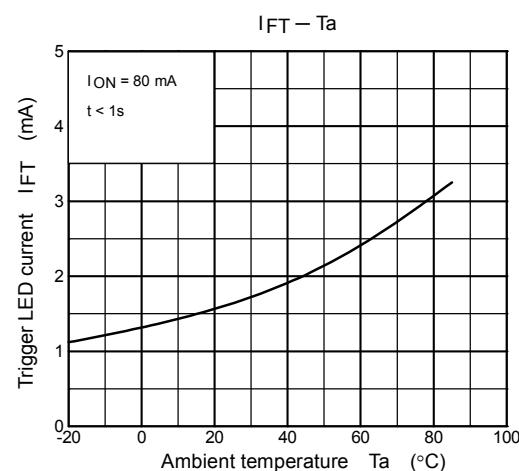
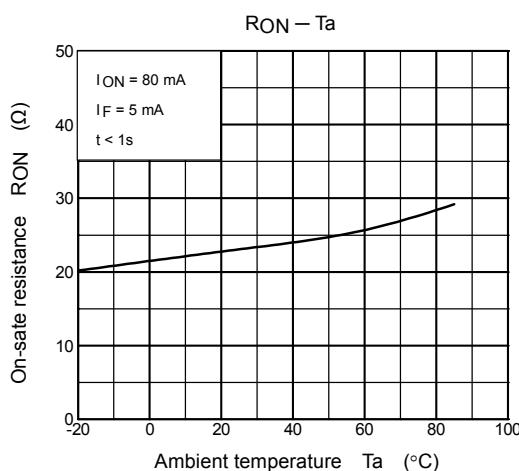
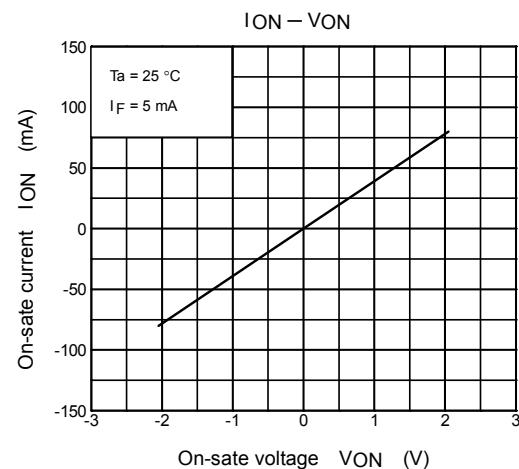
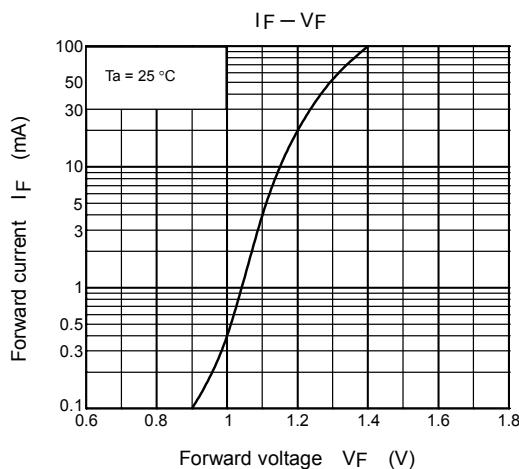
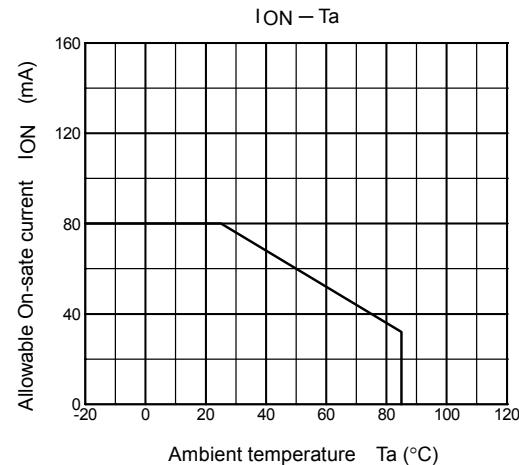
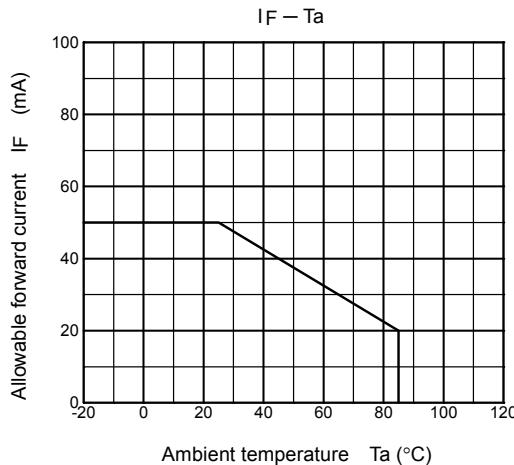
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)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

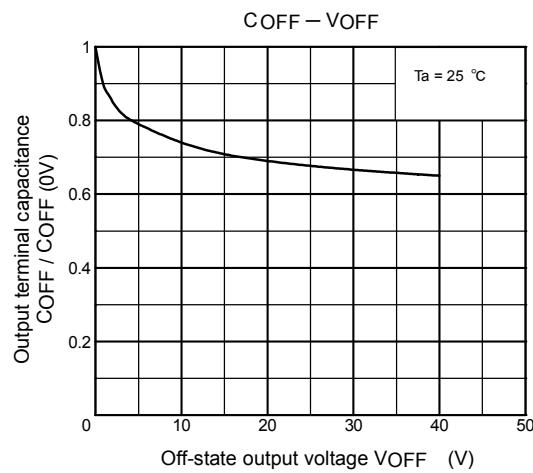
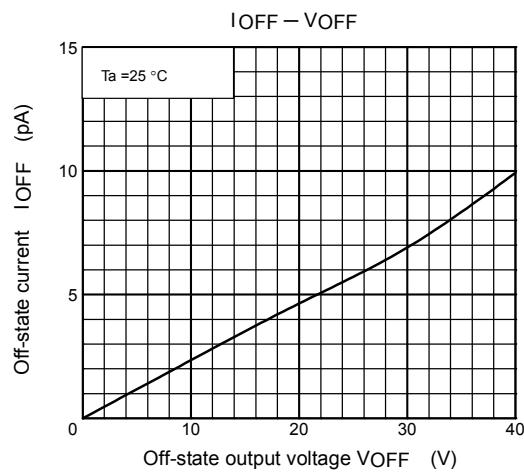
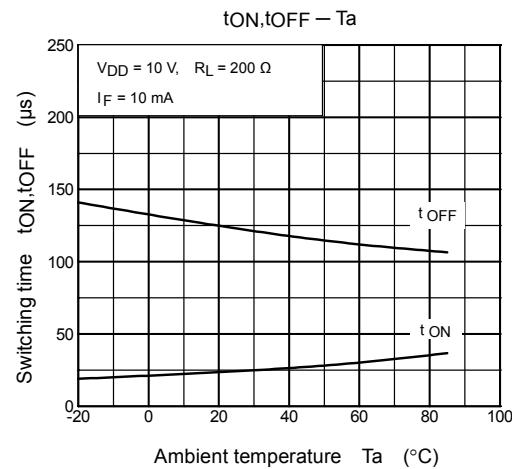
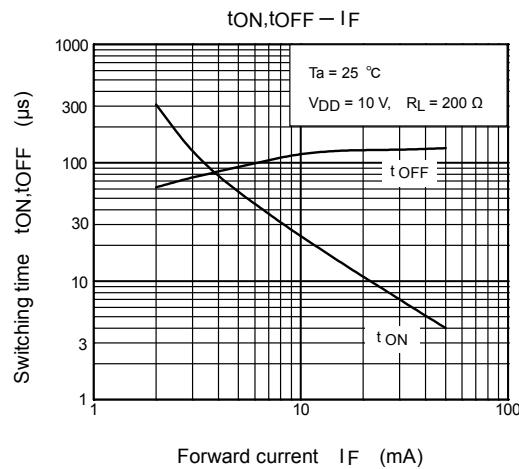
SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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

(NOTE 2) : SWITCHING TIME TEST CIRCUIT







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