

TOSHIBA PHOTOCOUPLER GaAs IRED &amp; PHOTO-MOS FET

# TLP3110

## MEASUREMENT INSTRUMENTS

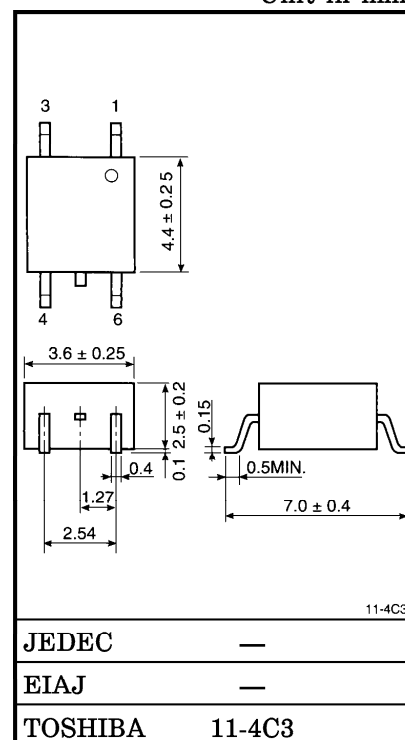
LOGIC IC TESTERS/MEMORY TESTERS

BOARD TESTERS/SCANNERS

Unit in mm

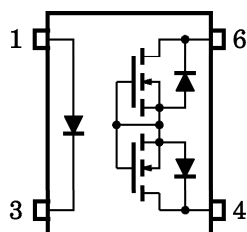
The TOSHIBA MINI FLAT PHOTO RELAY TLP3110 is a small outline photo relay, suitable for surface mount assembly. The TLP3110 consists of a GaAs infrared emitting diode optically coupled to a photo-MOSFET in a 4 pin lead package (MFSOP6), and has characteristics of small off-state current and small output terminal capacitance, which enable the TLP3110 to be applied to measurement instruments.

- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 4 mA (MAX.)
- On-State Current : 350 mA (MAX.)
- On-State Resistance : 1.2  $\Omega$  (MAX.)
- Isolation Voltage : 1500 V<sub>rms</sub> (MIN.)



Weight : 0.1 g

## PIN CONFIGURATION (TOP VIEW)



- 1 : ANODE  
 3 : CATHODE  
 4 : DRAIN  
 6 : DRAIN

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## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	6	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Voltage	V <sub>OFF</sub>	60	V
	On-State Current	I <sub>ON</sub>	350	mA
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature		T <sub>stg</sub>	−40~125	°C
Operating Temperature		T <sub>opr</sub>	−20~85	°C
Lead Soldering Temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)		BV <sub>S</sub>	1500	V <sub>rms</sub>

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

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>OFF</sub>	—	—	48	V
Forward Current	I <sub>F</sub>	10	—	30	mA
On-State Current	I <sub>ON</sub>	—	—	350	mA
Operating Temperature	T <sub>opr</sub>	25	—	50	°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> = 20 mA	1.0	1.2	1.4	V
	Reverse Voltage	I <sub>R</sub>	V <sub>R</sub> = 6 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> = 30 V, Ta = 50°C	—	0.4	1	nA
	Capacitance	C <sub>OFF</sub>	V = 0, f = 1 MHz	—	100	150	pF

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I <sub>FT</sub>	I <sub>ON</sub> = 350 mA	—	—	4	mA
ON-State Resistance	R <sub>ON</sub>	I <sub>ON</sub> = 350 mA, I <sub>F</sub> = 5 mA	—	0.9	1.2	Ω

ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	CS	VS = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	RS	VS = 500 V, R.H. ≤ 60%	$5 \times 10^{10}$	$10^{14}$	—	Ω
Isolation Voltage	BVS	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	tON	RL = 200 Ω (Note 2)	—	—	1	ms
Turn-OFF Time	tOFF	VDD = 20 V, IF = 10 mA	—	—	1	

(Note 2) : SWITCHING TIME TEST CIRCUIT

