

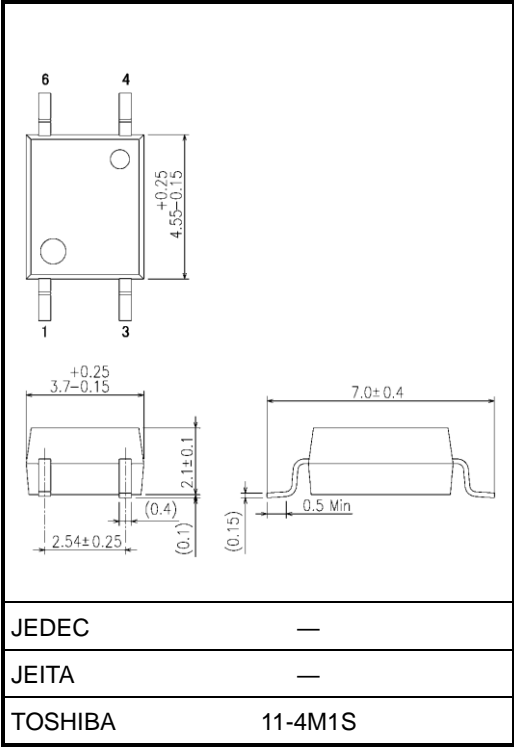
TLX9910

Automotive
MOSFET Gate Drivers

The TLX9910 is a photocoupler in the SO6 package that consists of an infrared light emitting diode optically coupled to a photodiode array. The photodiodes are connected in series, making the TLX9910 suitable for MOS gate drive applications.

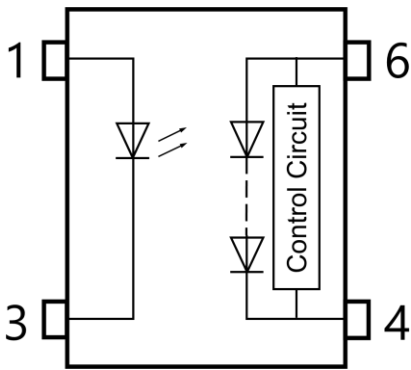
- Open voltage: 13.5 V (min)
- Short current: 8 μ A (min)
- Isolation voltage: 3750 Vrms (min)
- AEC-Q101 qualified

Unit: mm



Weight: 0.08 g (typ.)

Pin Configuration (top view)



- 1: Anode (Input)
- 3: Cathode (Input)
- 4: Cathode (Output)
- 6: Anode (Output)

Start of commercial production
2023-10

Absolute Maximum Rating (Unless otherwise specified, Ta = 25°C) (Note)

Characteristics		Symbol	Rating	Unit
LED	Input forward current	I _F	30	mA
	Input forward current (Ta = 125 °C)	I _F	10	
	Input forward current derating (Ta ≥ 100 °C)	ΔI _F /ΔTa	-0.8	mA/°C
	Input power dissipation	P _D	50	mW
	Input power dissipation derating (Ta ≥ 100 °C)	ΔP _D /ΔTa	-1.3	mW/°C
	Input reverse voltage	V _R	3	V
Detector	Output forward current	I _{FD}	50	μA
	Output reverse voltage	V _{RD}	20	V
	Output power dissipation (-40 °C ≤ Ta ≤ 125 °C)	P _O	0.5	mW
Common	Operating temperature	T _{opr}	-40 to 125	°C
	Storage temperature	T _{stg}	-55 to 135	°C
	Lead soldering temperature (10 s)	T _{sol}	260	°C
	Isolation voltage (AC, 60 s, R.H. ≤ 60%) (Note 1)	BVs	3750	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: This device is considered as a two-terminal device: Pins 1 and 3 are shorted together, and pins 4 and 6 are shorted together.

Recommended Operating Conditions (Note)

Characteristics	Symbol	Min	Typ.	Max	Unit
Input forward current	I _F	—	12	15	mA
Operating temperature	T _{opr}	-40	—	105	°C

Note: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this data sheet should also be considered.

Electrical Characteristics (Unless otherwise specified, Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Input forward voltage	V _F	I _F = 10 mA	1.5	1.65	1.8	V
	Input reverse current	I _R	V _R = 3 V	—	—	10	μA
	Input capacitance	C _T	V = 0 V, f = 1 MHz	—	45	—	pF

Coupled Electrical Characteristics (Unless otherwise specified, Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I _{FT}	V _{OC} ≥ 10 V	—	—	3	mA
Open voltage	V _{OC}	I _F = 10 mA	13.5	17.5	—	V
		I _F = 10 mA, Ta = 125°C	8	11	—	
Short-circuit current	I _{SC}	I _F = 10 mA	8	18	—	μA
		I _F = 10 mA, Ta = 125°C	6	13	—	

Isolation Characteristics (Ta = 25°C)

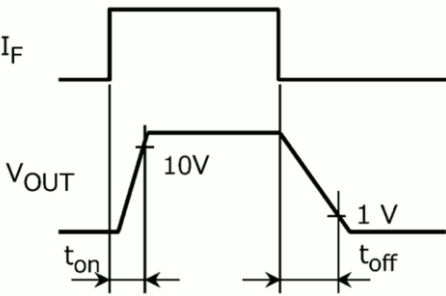
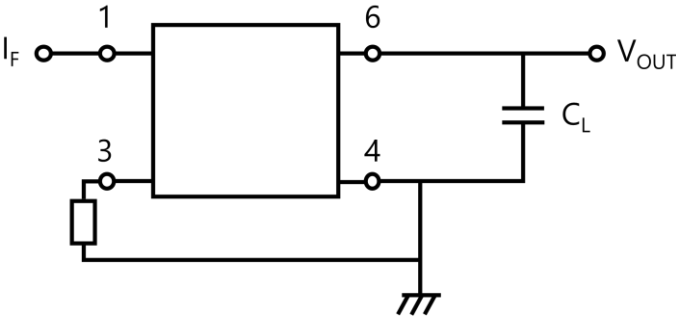
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Total capacitance (input to output)	C _S	V _S = 0 V, f = 1 MHz (Note 1)	—	0.8	—	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60 % (Note 1)	10 ¹²	10 ¹⁴	—	Ω
Isolation voltage	BV _S	AC, 60 s (Note 1)	3750	—	—	Vrms

Note 1: This device is considered as a two-terminal device: Pins 1 and 3 are shorted together, and pins 4 and 6 are shorted together.

Switching Characteristics (Unless otherwise specified, Ta = 25°C)

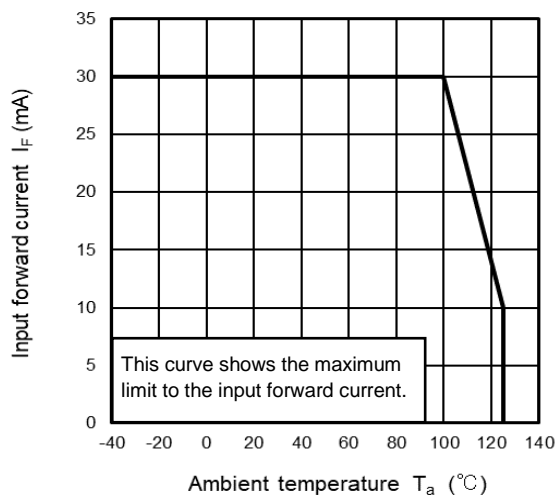
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t _{on}	I _F = 10 mA, C _L = 1000 pF (Note 2)	—	0.5	1	ms
Turn-off time	t _{off}		—	0.1	1	

Note 2: Switching time test circuit, Waveform

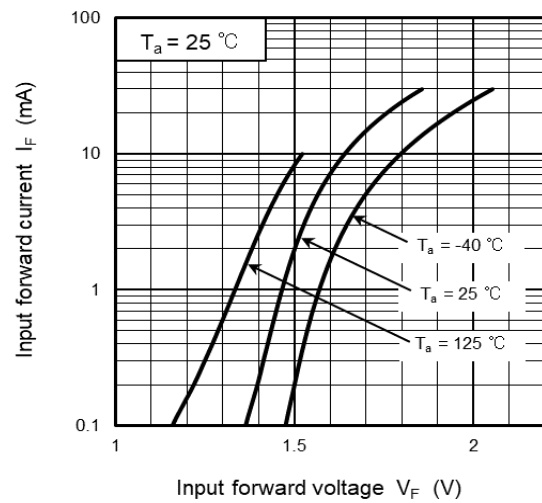


Characteristics curve (Note)

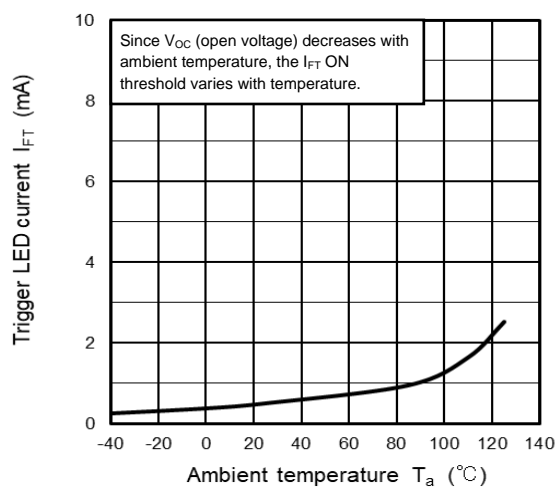
$I_F - T_a$



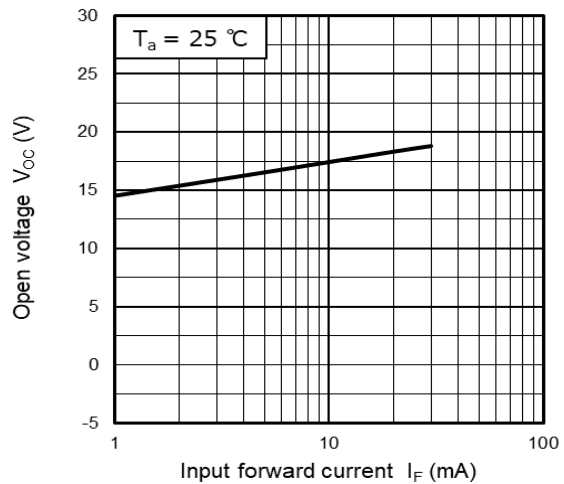
$I_F - V_F$



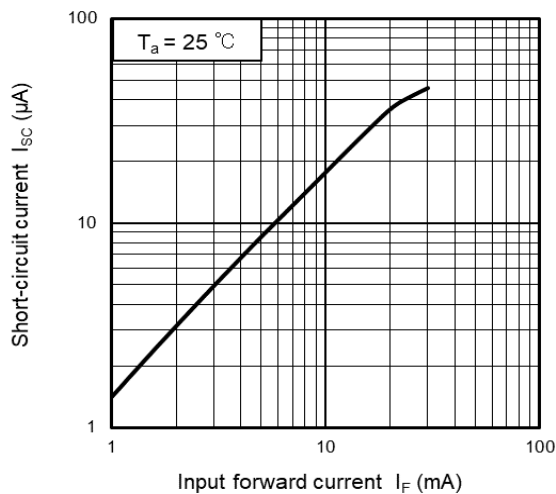
$I_{FT} - T_a$



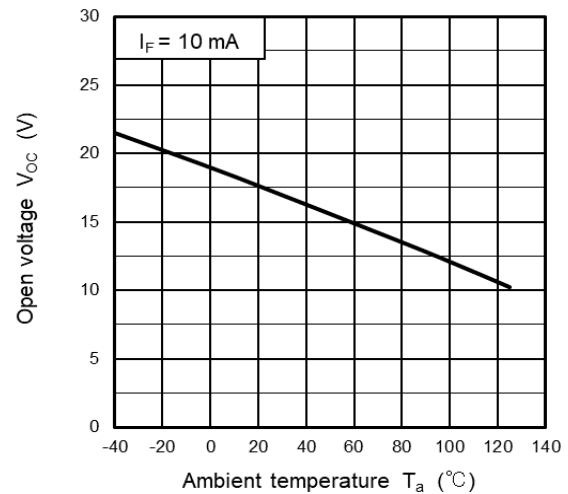
$V_{OC} - I_F$

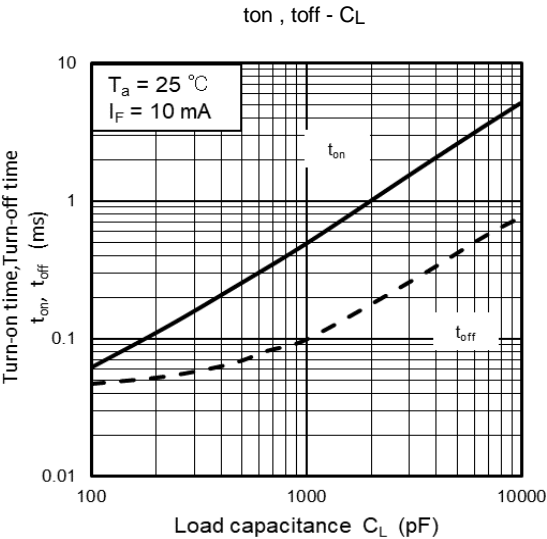
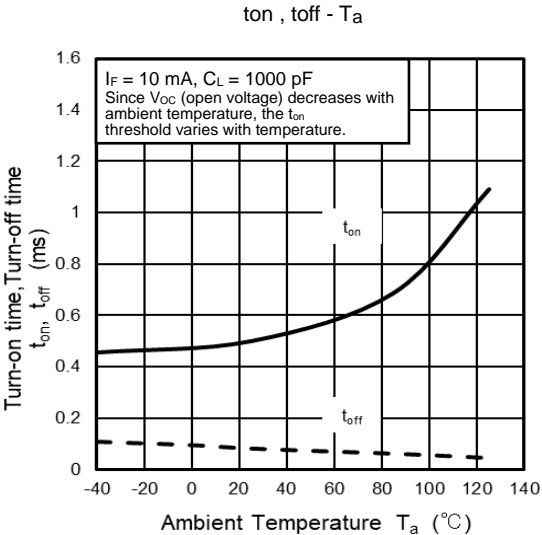
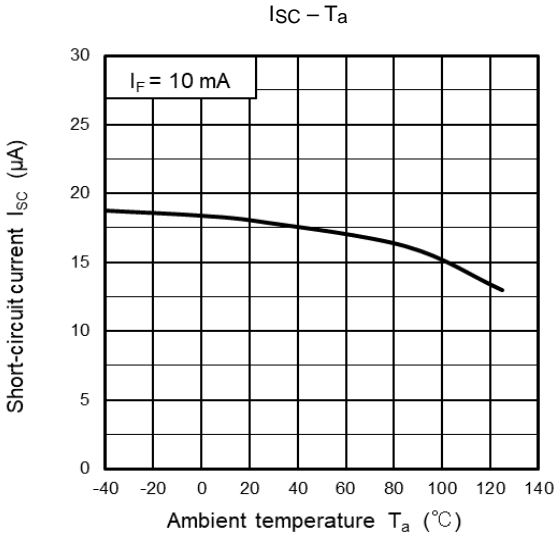


$I_{SC} - I_F$



$V_{OC} - T_a$





Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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