TOSHIBA Photocoupler GaAs Ired & Photo-Transistor

TLP127

Programmable Controllers DC-Output Module Telecommunication

The TOSHIBA mini flat coupler TLP127 is a small outline coupler, suitable for surface mount assembly.

TLP127 consists of a gallium arsenide infrared emitting diode, optically coupled to a darlington photo transistor with an integral base–emitter resistor, and provides $300V\ VCEO$.

- Collector-emitter voltage: 300 V (min.)
- Current transfer ratio: 1000% (min.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349
- BSI approved: BS EN60065:2002, certificate no.8927 BS EN60950-1:2002, certificate no.8928

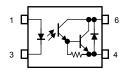
Unit in mm

6 4
7 7.0 ± 0.4
0.4 10
0.5 MIN.

11-4C1

Weight: 0.09 g

Pin Configurations (top view)



- 1 : ANODE
- 3 : CATHODE
- 4 : EMITTER
- 6 : COLLECTOR

Absolute Maximum Ratings (Ta = 25°C)

	Characteristic	Symbol	Rating	Unit
	Forward current	lF	50	mA
ED	Forward current derating	ΔI _F / °C	–0.7 (Ta ≥ 53°C)	mA / °C
	Pulse forward current	IFP	1 (100µs pulse, 100pps)	Α
	Reverse voltage	V _R	5	V
	Junction temperature	Tj	125	°C
	Collector-emitter voltage	V _{CEO}	300	V
	Emitter-collector voltage	V _{ECO}	0.3	V
tor	Collector current	IC	150	mA
Detector	Collector power dissipation	PC	150	mW
	Collector power dissipation derating (Ta ≥ 25°C)	ΔP _C / °C	-1.5	mW / °C
	Junction temperature	Tj	125	°C
Storage temperature range		T _{stg}	-55~125	°C
Operating temperature range		T _{opr}	-55~100	°C
Lead soldering temperature		T _{sol}	260 (10s)	°C
Total package power dissipation		P _T	200	mW
Total package power dissipation derating (Ta ≥ 25°C)		ΔP _T / °C	-2.0	mW / °C
Isolation voltage (Note 1)		BV _S	2500 (AC, 1min., R.H.≤ 60%)	Vrms

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, 3 shorted together and pins 4, 6 shorted together.

Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
	Forward voltage	V_{F}	I _F = 10 mA	1.0	1.15	1.3	V
ED	Reverse current	I _R	VR = 5V	_	_	10	μA
	Capacitance	C _T	V = 0, f = 1 MHz	_	30	_	pF
<u>.</u>	Collector–emitter breakdown voltage	V _(BR) CEO	I _C = 0.1 mA	300	_	_	V
	Emitter-collector breakdown voltage	V _(BR) ECO	I _E = 0.1 mA	0.3	_	_	V
	Collector dark current	I _{CEO}	V _{CE} = 200 V	_	10	200	nA
			V _{CE} = 200 V, Ta = 85°C	_	_	20	μA
	Capacitance collector to emitter	C _{CE}	V = 0, f = 1 MHz	_	12	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	MIn.	Тур.	Max.	Unit
Current transfer ratio	I _C / I _F	I _F = 1mA, V _{CE} = 1 V	1000	4000	_	%
Saturated CTR	I _C / I _{F (sat)}	I _F = 10 mA, V _{CE} = 1 V	500	_	-	%
Collector-emitter saturation voltage	Vo= ())	I _C = 10 mA, I _F = 1 mA	_	_	1.0	- V
	V _{CE} (sat)	I _C = 100 mA, I _F = 10 mA	0.3	-	1.2	

Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Capacitance (input to output)	CS	V _S = 0, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R _S	V _S = 500 V, R.H.≤ 60%	5×10 ¹⁰	10 ¹⁴	_	Ω
Isolation voltage		AC, 1 minute	2500	_	_	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	BV_S	AC, 1 second, in oil	_	5000	_	V _{rms}
		DC, 1 minute, in oil	_	5000	_	V_{dc}

Switching Characteristics (Ta = 25°C)

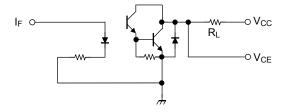
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Rise time	t _r		_	40	_	
Fall time	t _f	V_{CC} = 10 V, I _C = 10 mA R _L = 100 Ω	_	15	_	μs
Turn-on time	t _{on}		_	50	_	
Turn-off time	t _{off}		_	15	_	
Turn-on time	ton		_	5	_	
Storage time	ts	$R_L = 180 \Omega$ (Fig.1) $V_{CC} = 10 \text{ V}, I_F = 16 \text{ mA}$	_	40	_	μs
Turn-off time	t _{OFF}		_	80	_	

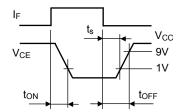
Recommended Operating Conditions

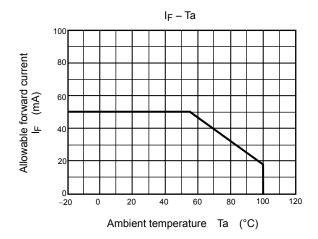
Characteristic	Symbol	Min.	Тур.	Max.	Unit
Supply voltage	V _{CC}	_	_	200	V
Forward current	lF	_	16	25	mA
Collector current	IC	_	_	120	mA
Operating temperature	T _{opr}	-25	_	85	°C

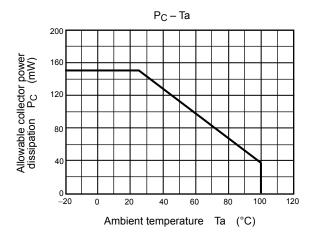
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

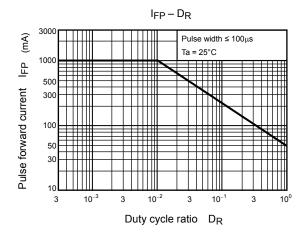
Fig. 1 Switching time test circuit

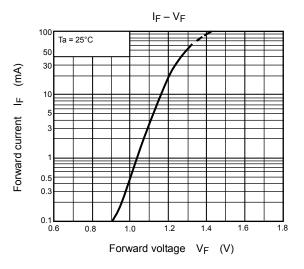


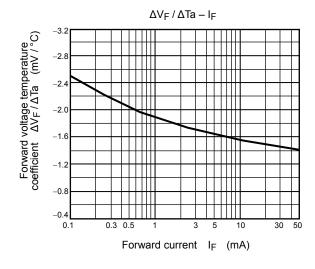


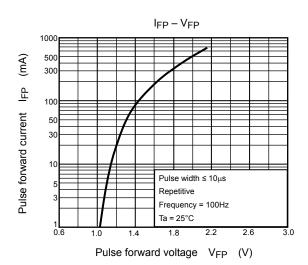


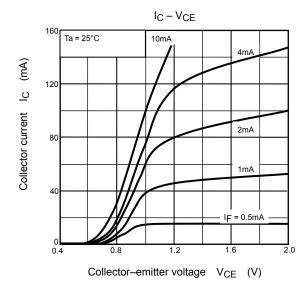


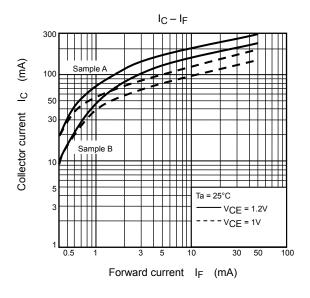


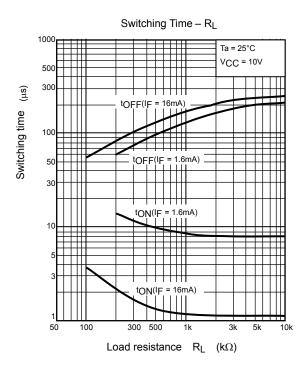


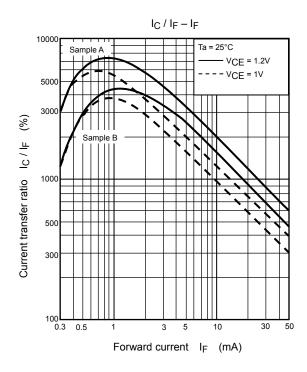


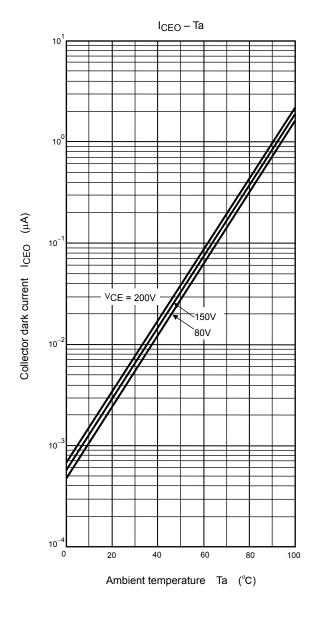


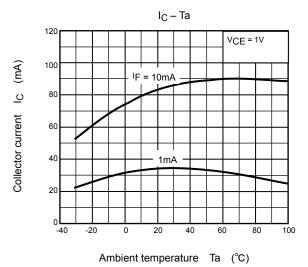


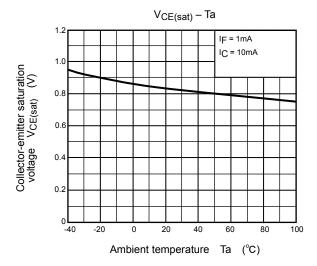












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