TOSHIBA Photocoupler GaAs Ired & Photo-Transistor

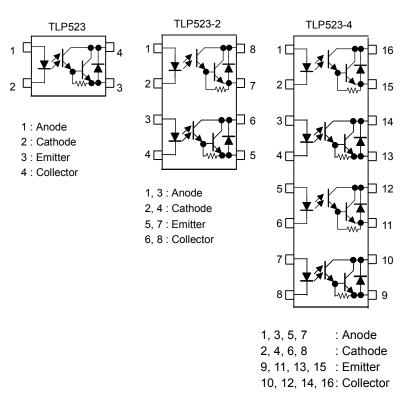
TLP523, TLP523–2, TLP523–4

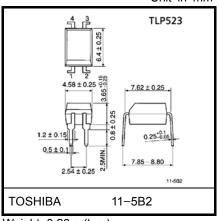
Programmable Controllers DC-Output Module Solid State Relay

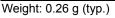
The TOSHIBA TLP523, -2 and -4 consists of a gallium arsenide infrared emitting diode coupled with a silicon, darlington connected, phototransistor which has an integral base-emitter resistor to optimize switching speed and elevated temperature characteristics. The TLP523-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP523-4 provide four isolated channels per package.

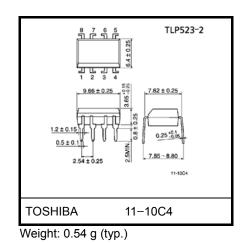
- Current transfer ratio: 500% (min.) ($I_F = 1 \text{ mA}$) •
- Isolation voltage: 2500 Vrms (min.)
- Collector-emitter voltage: 55 V (min.)
- Leakage current: 10µA (max.) (Ta = 85°C)
- UL recognized: UL1577, file no. E67349

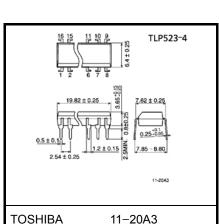
Pin Configurations (top view)













Weight: 1.1 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

			Ra			
	Characteristic	Symbol	TLP523	TLP523–2 TLP523–4	Unit	
	Forward current	١ _F	60	50	mA	
Ģ	Forward current derating	ΔI _F /°C	–0.7 (Ta ≥ 39°C)	–0.5 (Ta ≥ 25°C)	mA /°C	
Ш	Pulse forward current	I _{FP}	1 (100µs pulse, 100pps)		А	
P P R C E C C E C C C C C C C C C C C C C C	Reverse voltage	V _R	5		V	
ector	Collector-emitter voltage	V _{CEO}	5	V		
	Emitter-collector voltage	V _{ECO}	0	V		
	Collector current	Ι _C	150		mA	
Dete	Collector power dissipation (1 circuit)	P _C	150	100	mW	
	Collector power dissipation derating (1 circuit (Ta \ge 25°C))	ΔP _C /°C	-1.5	-1.0	mW /°C	
Оре	erating temperature range	T _{opr}	-55~100		°C	
Stor	rage temperature range	T _{stg}	-55	~125	°C	
Lea	d soldering temperature (10 s)	T _{sol}	20	260		
Tota	al power dissipation	Ρ _T	250	150	mW	
	al power dissipation derating ≥ 25°C)	ΔP _T /°C	-2.5	-1.5	mW /°C	
Isola	ation voltage (Note 1)	BVS	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: LED side pins shorted together and detector side pins shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Тур.	Max.	Unit
Supply voltage	V _{CC}	—	5	24	V
Forward current	١ _F	—	16	20	mA
Operating temperature range	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.

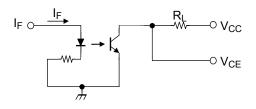
Electrical Characteristics (Ta = 25°C)

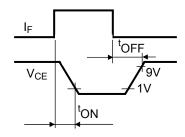
	Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
	Forward voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
LED	Reverse current	I _R	V _R = 5 V	—	-	10	μA
	Capacitance	CT	V = 0, f = 1 MHz	_	30	_	pF
Detector	Collector–emitter breakdown voltage	V _(BR) CEO	I _C = 1 mA	55	_	_	V
	Collector dark current	ICEO	V _{CE} = 24 V	_	10	200	nA
			V _{CE} = 24 V, Ta = 85°C	_	0.5	10	μA
	Capacitance collector to emitter	C _{CE}	V = 0, f = 1 MHz		10		pF
	Current transfer ratio	I _C / I _F	I _F = 1 mA, V _{CE} = 1 V	500	2000		%
Coupled	Collector-emitter saturation voltage	V _{CE(sat)}	I _C = 50 mA, I _F = 10 mA	Ι	Ι	1	V
	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

Switching Characteristics (Ta = 25°C)

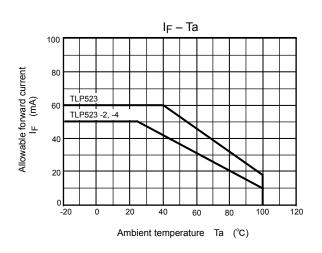
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Turn-on time	t _{ON}	V _{CC} = 10 V, R _L = 180 Ω I _F = 16 mA	-	3	_	μs
Turn-off time	tOFF		—	80	-	μs

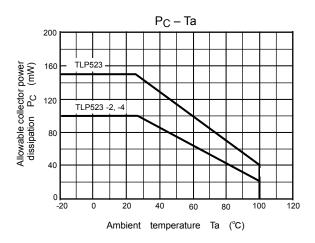
Switching Time Test Circuit

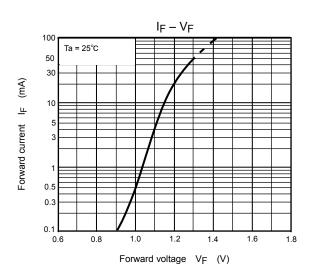


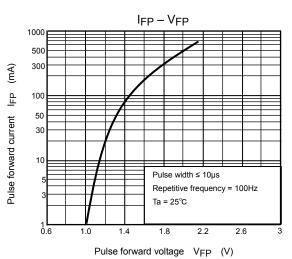


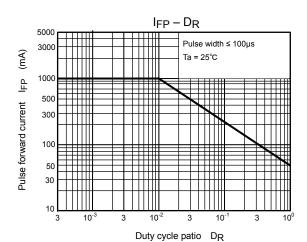
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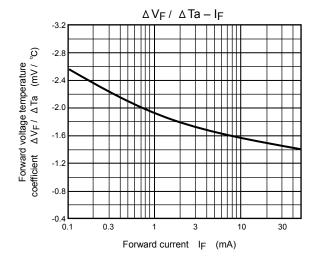




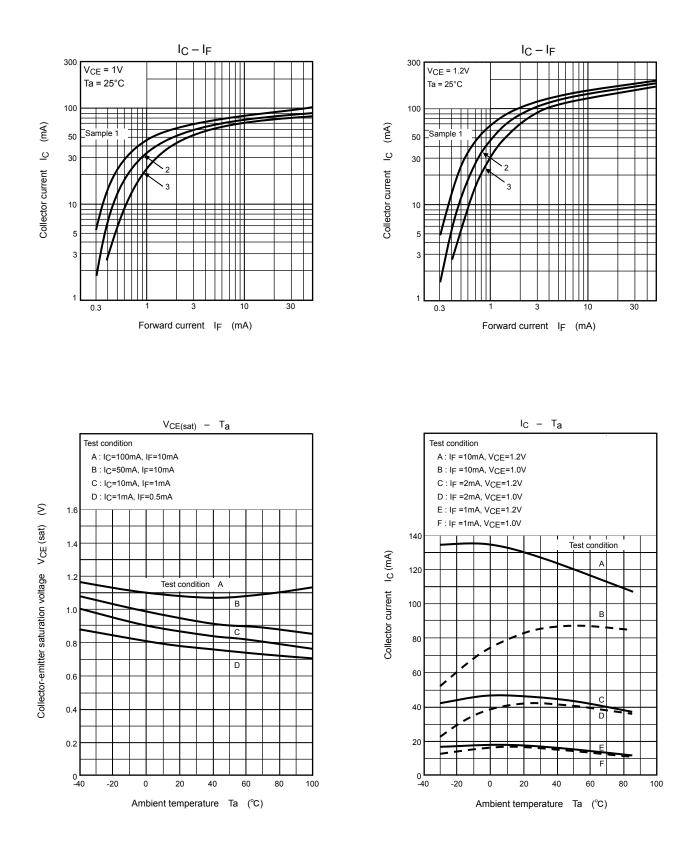




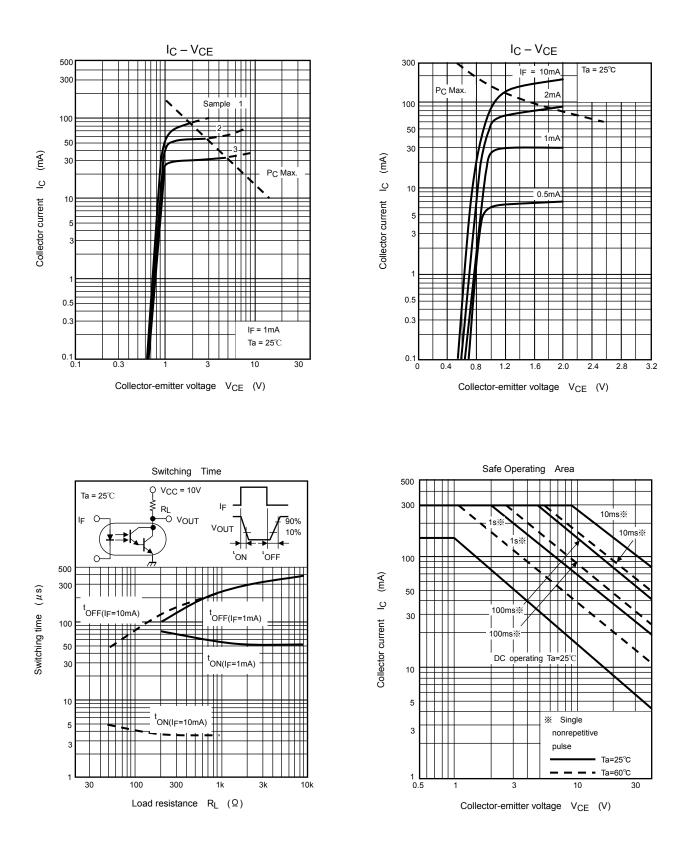




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