

TOSHIBA Photocoupler GaAs IRED & Photo-Transistor

# TLP627, TLP627-2, TLP627-4

Programmable Controllers

DC-output Module

Telecommunication

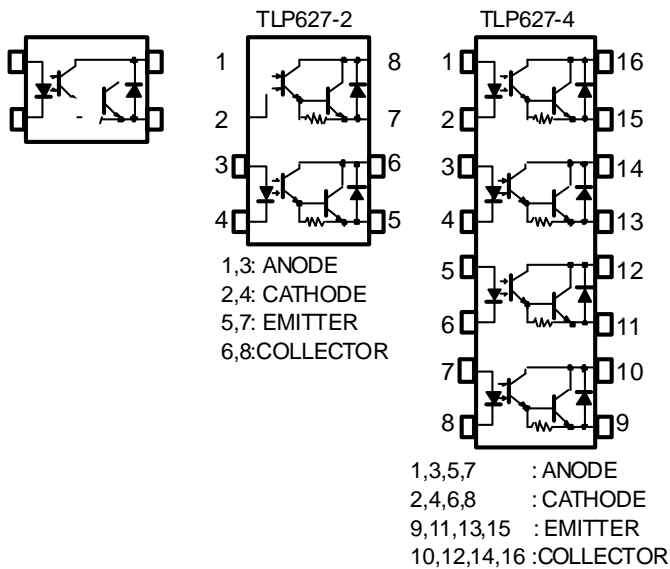
The TOSHIBA TLP627,-2 and -4 consists of a gallium arsenide infrared emitting diode optically coupled to a darlington connected phototransistor which has an integral base-emitter resistor to optimize switching speed and elevated temperature characteristics.

The TLP627-2 offers two isolated channels in a eight lead plastic DIP, while the TLP627-4 provide four isolated channels per package.

- Collector-Emitter Voltage : 300V(Min)
- Current Transfer Ratio : 1000%(Min)
- Isolation Voltage : 5000Vrms(Min)
- UL Recognized : UL1577, File No.E67349

	Made in Japan		Made in Thailand	
UL Recognized	E67349	*1	E152349	*1
BSI Approved	7426, 7427	*2	7426, 7427	*2

### Pin Configuration (top view)



## Absolute Maximum Ratings (Ta=25°C)

Characteristics		Symbol	Rating		Unit
			TLP627	TLP627-2 TLP627-4	
LED	Forward Current	$I_F$	60	50	mA
	Forward Current Derating	$I_F / ^\circ\text{C}$	-0.7(Ta 39°C)	-0.5(Ta 25°C)	mA / °C
	Pulse Forward Current	$I_{FP}$	1(100µs pulse, 100pps)		A
	Power Dissipation (1 Circuit)	$P_D$	100	70	mW
	Power Dissipation Derating (Ta 25°C, 1 Circuit)	$P_D / ^\circ\text{C}$	-1.0	-0.7	mW / °C
	Reverse Voltage	$V_R$	5		V
	Junction Temperature	$T_j$	125		°C
Detector	Collector-Emitter Voltage	$V_{CEO}$	300		V
	Emitter -Collector Voltage	$V_{ECO}$	0.3		V
	Collector Current	$I_C$	150		mA
	Collector Power Dissipation (1 Circuit)	$P_C$	150(*300)	100	mW
	Collector Power Dissipation Derating (Ta 25°C, 1 Circuit)	$P_C / ^\circ\text{C}$	-1.5(*-3.5)	-1.0	mW / °C
	Junction Temperature	$T_j$	125		°C
Operating Temperature Range		$T_{opr}$	-55~100		°C
Storage Temperature Range		$T_{stg}$	-55~125		°C
Lead Soldering Temperature (10s)		$T_{sold}$	260(10sec)		°C
Total Package Power Dissipation		$P_T$	250(*320)	150	mW
Total Package Power Dissipation Derating (Ta 25°C, 1 Circuit)		$P_T / ^\circ\text{C}$	-2.5(*-3.2)	-1.5	mW / °C
Isolation Voltage (AC, 1min., R.H. 60%) (Note1)		$BV_S$	5000		V <sub>rms</sub>

\*IF=20mA Max

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).

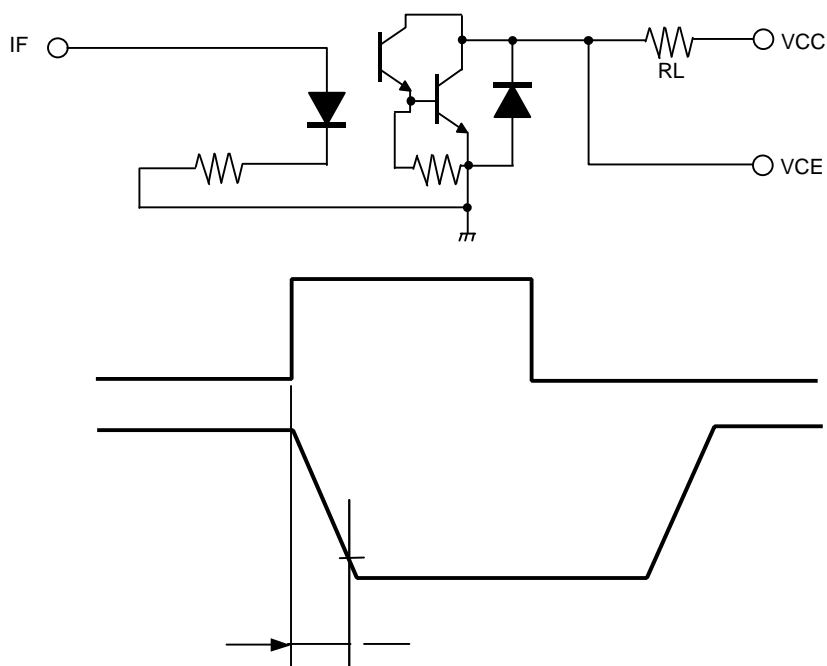
## Individual Electrical Characteristics (Ta=25°C)

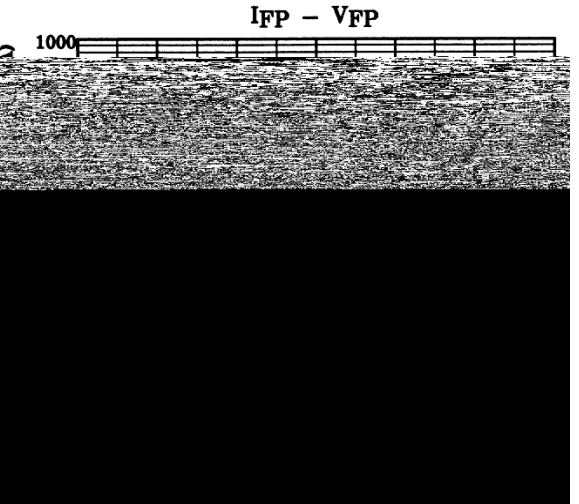
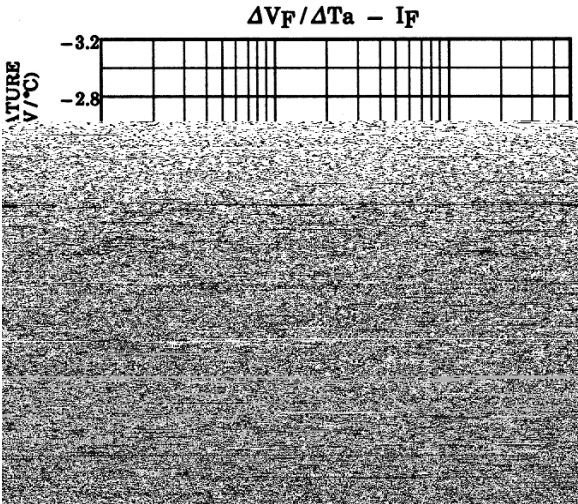
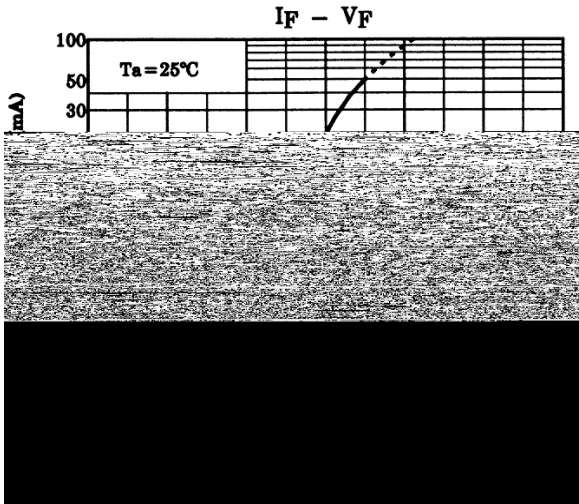
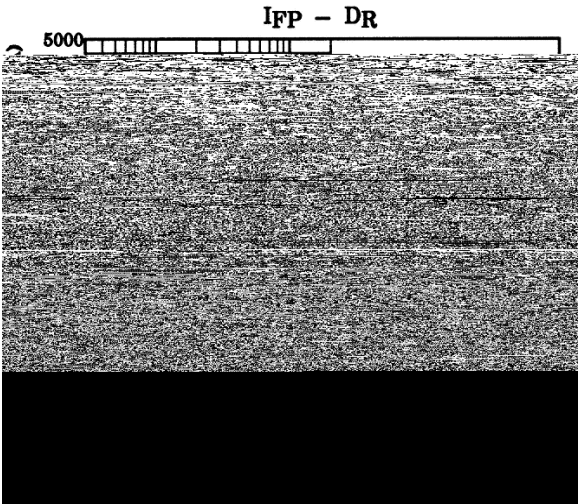
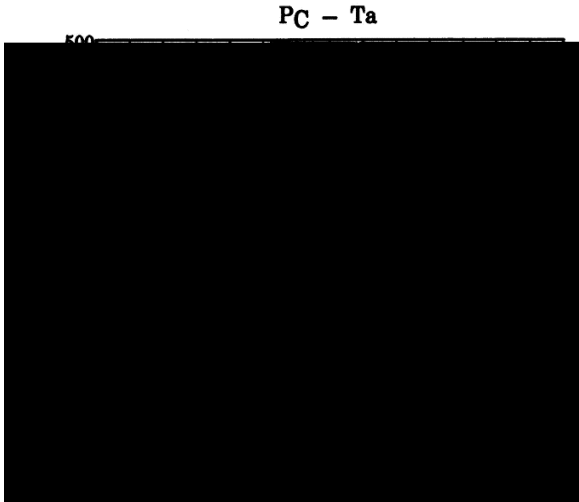
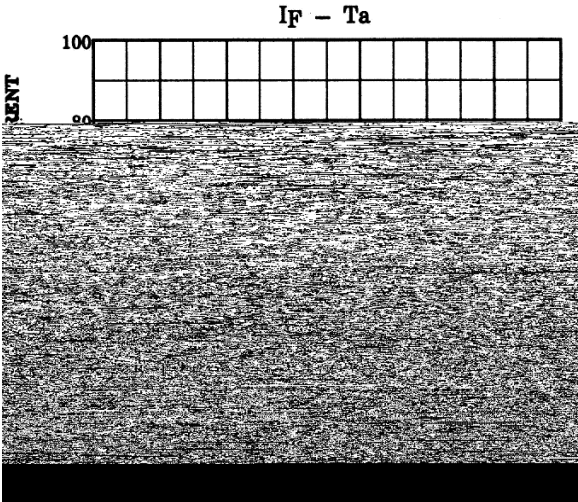
Characteristics		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward Voltage	$V_F$	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse Current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.1\text{mA}$	300	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	0.3	—	—	V
	Collector Dark Current	$I_{CEO}$	$V_{CE} = 200\text{V}$ V	—	10	200	nA

**Switching Characteristics (Ta=25°C)**

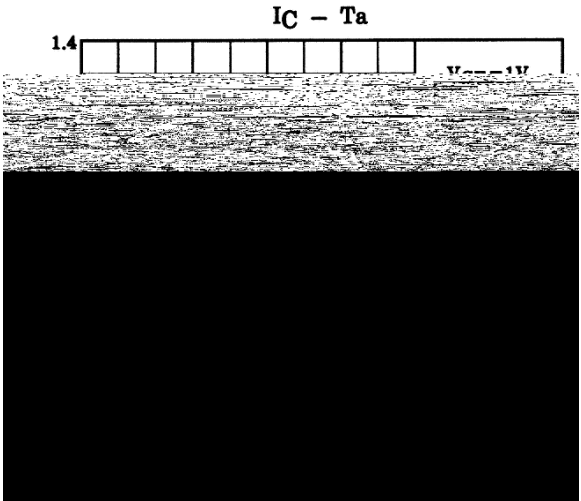
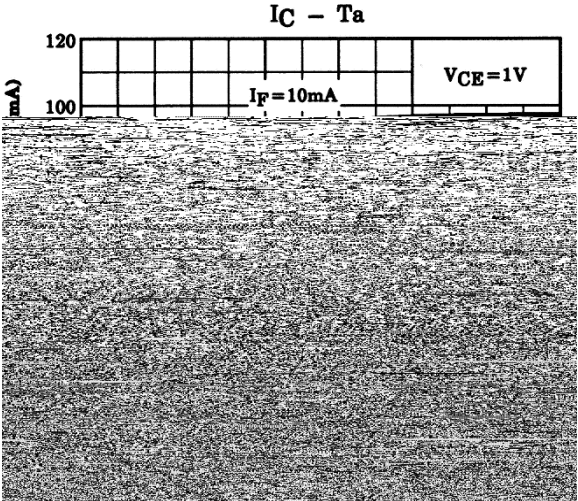
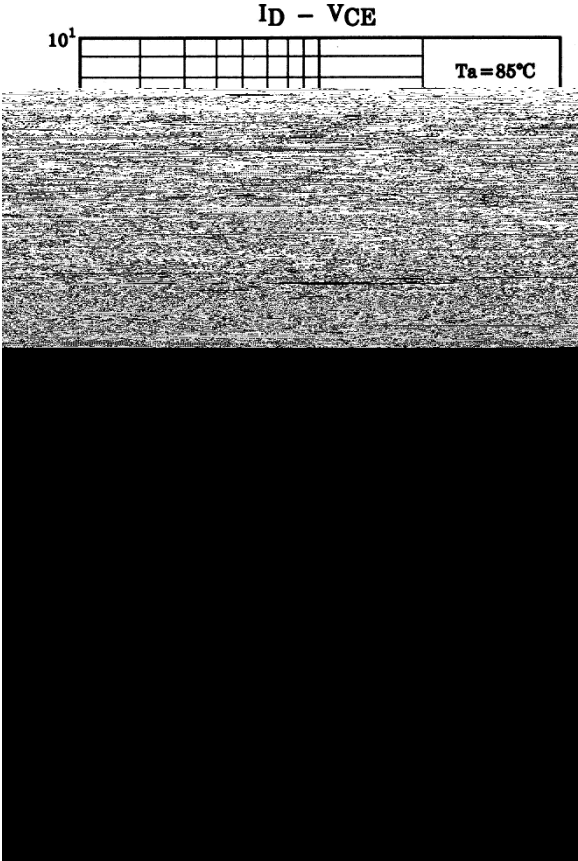
Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Rise Time	$t_r$	$V_{CC}=10V$ $I_C=10mA$ $R_L=100\Omega$	—	40	—	$\mu s$
Fall Time	$t_f$		—	15	—	
Turn-on Time	$t_{on}$		—	50	—	
Turn-off Time	$t_{off}$		—	15	—	
Turn-on Time	$t_{ON}$	$R_L=180\Omega$ (Fig.1) $V_{CC}=10V, I_F=16mA$	—	5	—	
Storage Time	$t_s$		—	40	—	
Turn-off Time	$t_{OFF}$		—	80	—	

**Fig.1 Switching Time Test Circuit**









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