

TOSHIBA Photocoupler GaAs Ired & Photo-Transistor

TLP624, TLP624-2, TLP624-4

Programmable Controllers

AC/DC-Input Module

Telecommunication

The TOSHIBA TLP624, -2 and -4 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-transistor.

The TLP624-2 offers two isolated channels in an eight lead plastic DIP, while the TLP624-4 provides four isolated channels in a sixteen plastic DIP.

- Collector-emitter voltage: 55V min.
- Current transfer ratio

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating		Unit
			TLP624	TLP624-2 TLP624-4	
LED	Forward current	I_F	60	50	mA
	Forward current detating	$I_F / ^\circ\text{C}$	$-0.7(\text{Ta } 39^\circ\text{C})$	$-0.5(\text{Ta } 25^\circ\text{C})$	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}	55		V
	Emitter-collector voltage	V_{ECO}	7		V
	Collector current	I_C	50		mA
	Collector power dissipation(1 circuit)	P_C	150	100	mW
	Collector power dissipation derating (Ta 25°C, 1 Circuit)	$P_C / ^\circ\text{C}$	-1.5	-1.0	mW / °C
	Junction temperature	T_j			

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		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	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$		30		pF
Detector	Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 0.5\text{mA}$	55			V
	Emitter-collector breakdown voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	7			V
	Collector dark current	I_{CEO}	$V_{CE} = 24\text{V}$		10	100	nA
			$V_{CE} = 24\text{V}, T_a = 85^\circ\text{C}$		2	50	μA
Capacitance collector to emitter	C_{CE}	$V=0, f=1\text{MHz}$		12		pF	

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Current transfer ratio	I_C / I_F	$I_F = 1\text{mA}, V_{CE} = 0.5\text{V}$ Rank BV	100		1200	%
			200		1200	
			50			

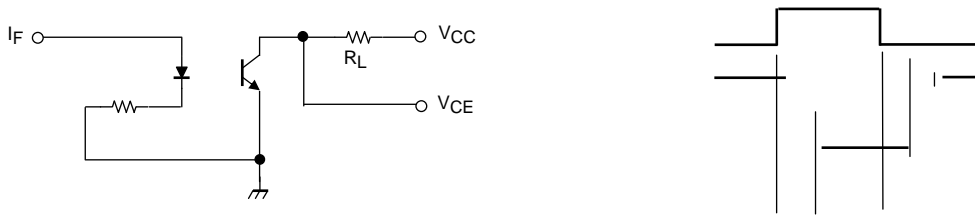
Isolation Characteristics (Ta = 25°C)

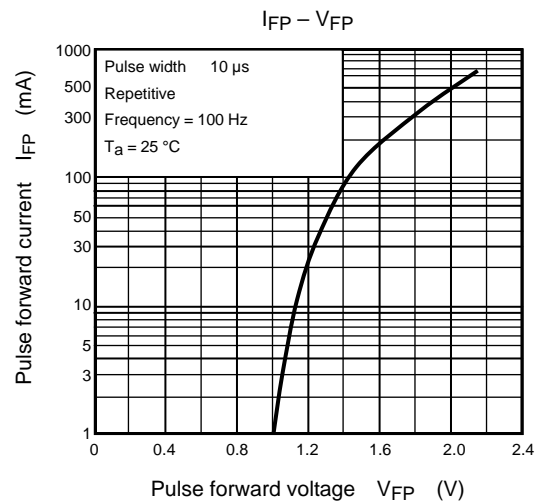
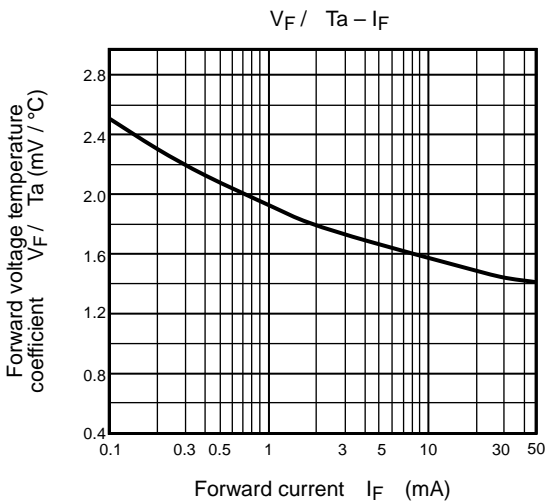
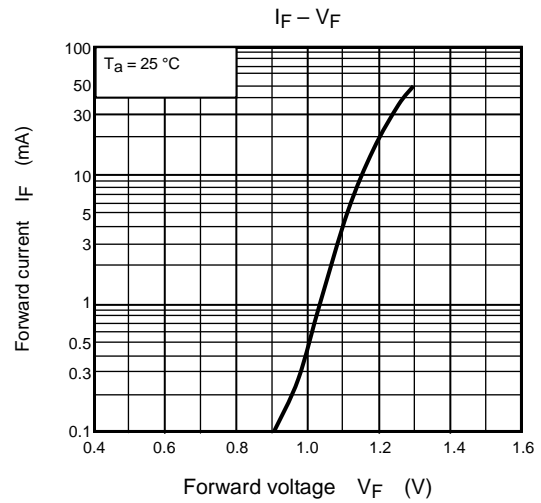
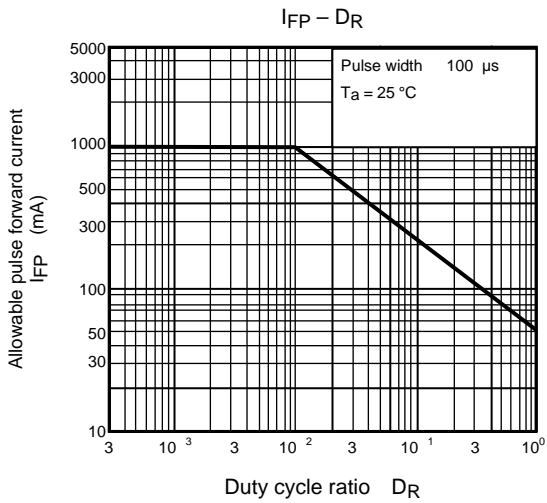
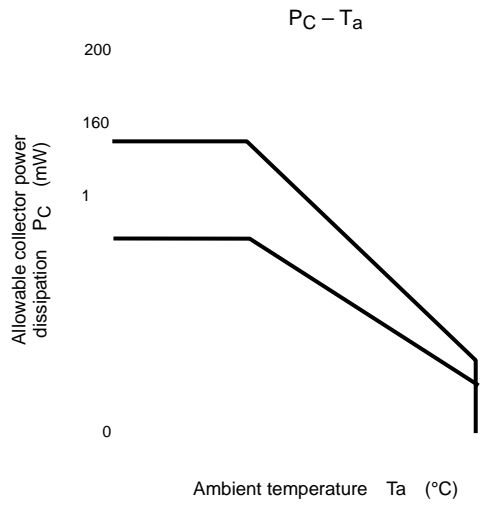
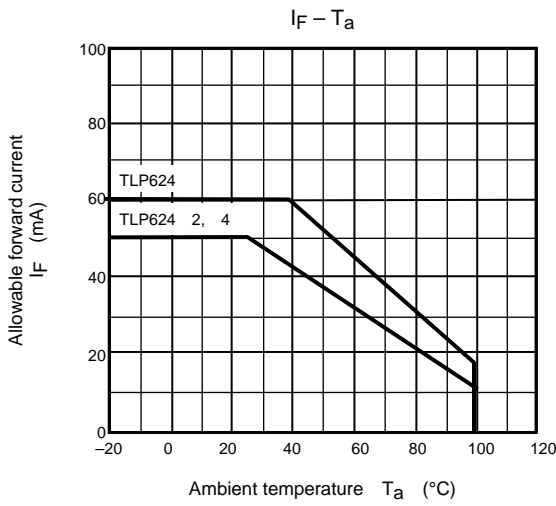
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C _S	V _S = 0, f = 1MHz		0.8		pF
Isolation resistance	R _S	V _S = 500V	5×10 ¹⁰	10 ¹⁴		
Isolation voltage	BV _S	AC, 1minute	5000			V _{rms}
		AC, 1second, in oil		10000		
		DC, 1 minute, in oil		10000		

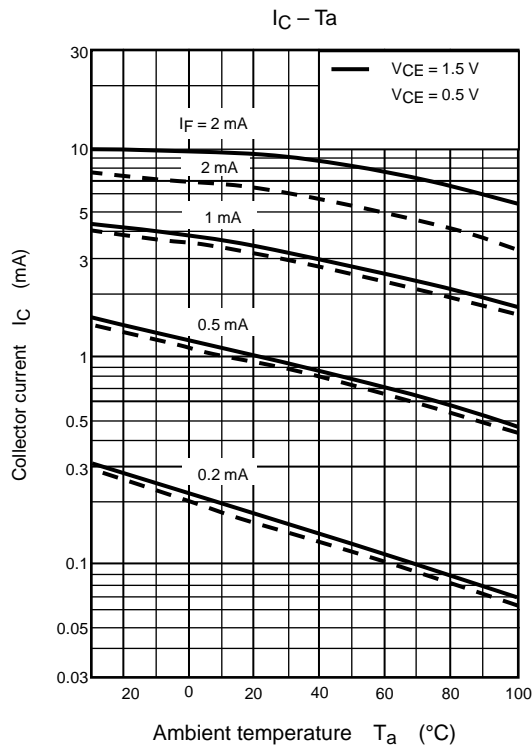
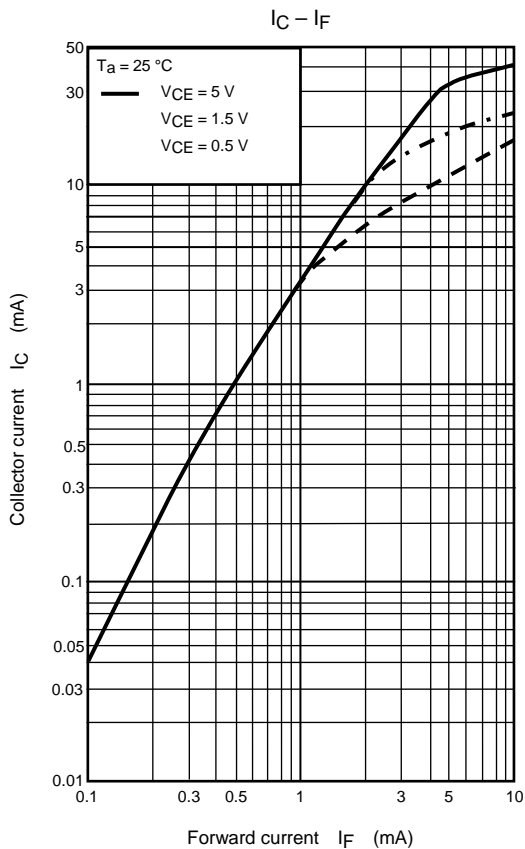
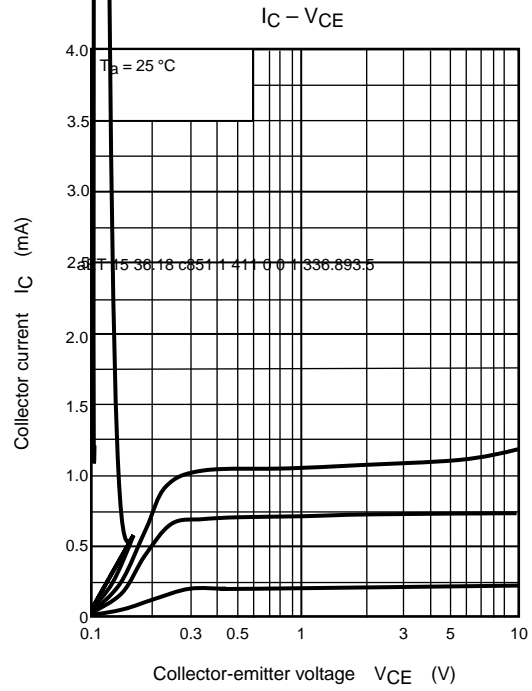
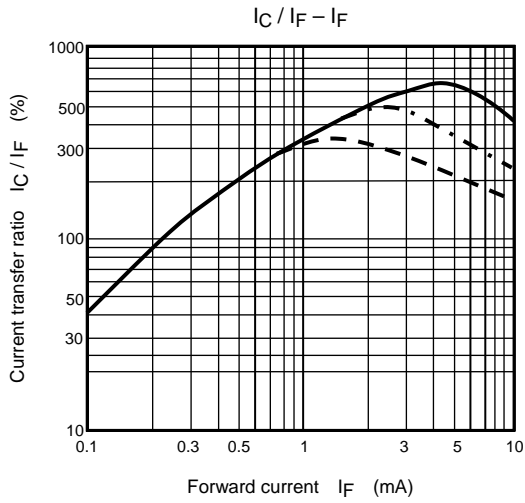
Switching Characteristics (Ta = 25°C)

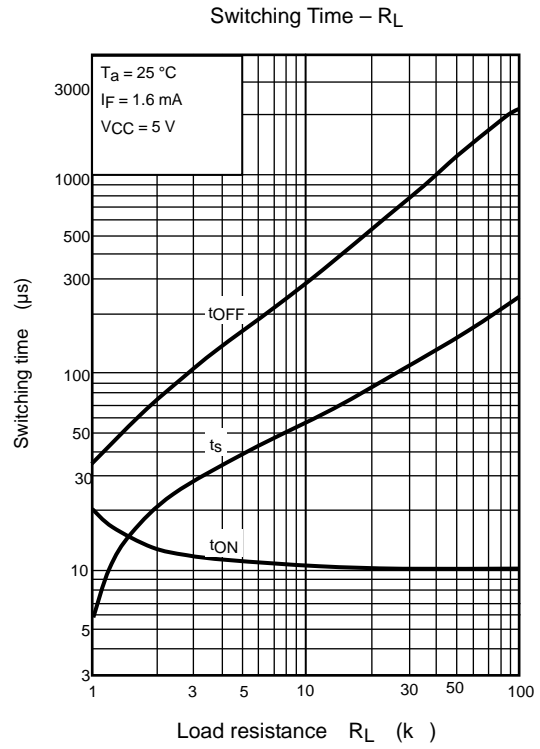
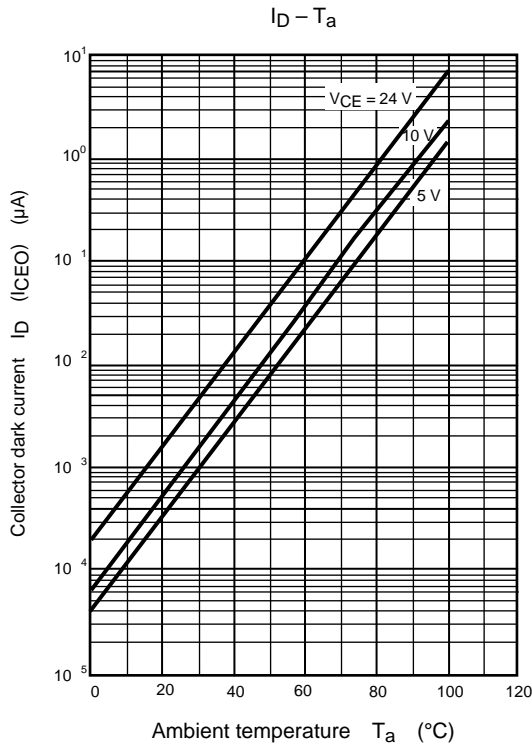
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Rise time	t _r	V _{CC} = 10V, I _C = 2mA R _L = 100		8		μs
Fall time	t _f			8		
Turn-on time	t _{on}			10		
Turn-off time	t _{off}			8		
Turn-on time	t _{ON}	R _L = 4.7 k (Fig.1) V _{CC} = 5 V, I _F = 1.6mA		10		μs
Storage time	t _S			50		
Turn-off time	T _{OFF}			300		

Fig. 1 Switching time test circuit









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