TOSHIBA Photocoupler GaA As IRED + Photo IC

Digital Logic Ground Isolation
Line Receiver
Microprocessor System Interfaces
Switching Power Supply Feedback Control
Transistor Inverter

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Characteristics			Symbol	Rating	Unit
LED	DC forward current	(Note 1)	I_F	25	mA
	Pulse forward current	(Note 2)	I_{FP}	50	mA
	Peak transient forward current	(Note 3)	I_{FPT}	1	A
	DC reverse voltage		V_R	5	V
	Diode power dissipation	(Note 4)	P_D	45	mW
Detector	Output current		I_O	8	mA
	Peak output current		I_{OP}	16	mA
	Output voltage		V_O	−0.5 to 15	V
	Supply voltage		V_{CC}	−0.5 to 15	V
	Output power dissipation	(Note 5)	P_O	100	mW
Operating temperature range			T_{opr}	−55 to 100	°C
Storage temperature range			T_{stg}	−55 to 125	°C
Soldering temperature (10 s)		(Note 6)	T_{sol}	260	°C
Isolation voltage (R.H. ≤ 60%, AC 1 min)		(Note 7)	BV_S	2500	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: Decreases at the rate of 0.8 mA/°C with the ambient temperature of 70°C or higher.

Note 2: Duty cycle of 50%, pulse width of 1 ms.
Decreases at the rate of 1.6 mA/°C with the ambient temperature of 70°C or higher.

Note 3: Pulse width ≤ 1 μs, 300 pps

Note 4: Decreases at the rate of 0.9 mW/°C with the ambient temperature of 70°C or higher.

Note 5: Decreases at the rate of 2 mW/°C with the ambient temperature of 70°C or higher.

Note 6: Soldering is performed 2 mm from the bottom of the package.

Note 7: Device considered a two-terminal device: pins 1, 2, and 3 shorted together and pins 4, 5 and 6 shorted together.

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Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	I_F = 16 mA		1.65	1.85	V
	Forward voltage temperature coefficient	$\Delta V_F/\Delta Ta$	I_F = 16 mA		−2		mV/°C
	Reverse current	I_R	V_R = 5 V			10	μA
	Pin-to-pin capacitance	C_T	V_F = 0 V, f = 1 MHz		45		pF
Detector	High-level output current	$I_{OH\ (1)}$	I_F = 0 mA, V_{CC} = V_O = 5.5 V		3	500	nA
		$I_{OH\ (2)}$	I_F = 0 mA, V_{CC} = V_O = 15 V			5	μA
		I_{OH}	I_F = 0 mA, V_{CC} = V_O = 15 V Ta = 70°C			50	
	High-level supply current	I_{CCH}	I_F = 0 mA, V_{CC} = 15 V		0.01	1	μA

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Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	I_O/I_F	I_F = 16 mA, V_{CC} = 4.5 V V_O = 0.4 V	20	40		%
		I_F = 16 mA, V_{CC} = 4.5 V V_O = 0.4 V, Ta = 0 to 70°C	15			
Low-level output voltage	V_{OL}	I_F = 16 mA, V_{CC} = 4.5 V I_O = 2.4 mA			0.4	V

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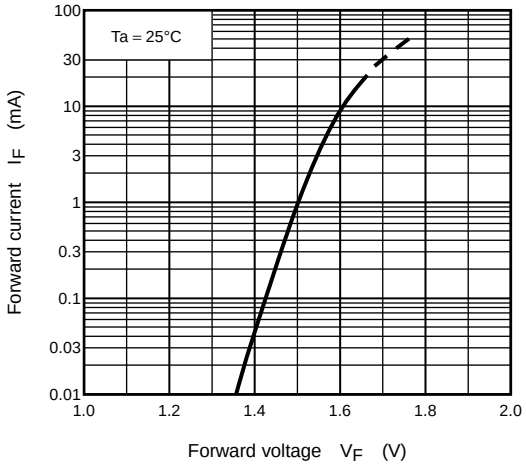
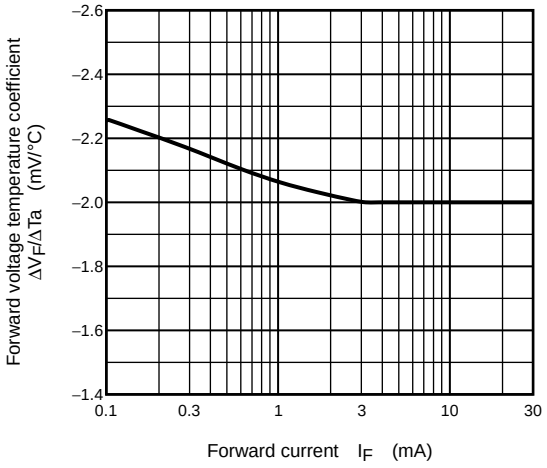
Characteristic	Symbol	Test Condition		Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0 V, f = 1 MHz	(Note 7)		0.8		pF
Isolation resistance	R_S	R.H. ≤ 60%, V_S = 500 V	(Note 7)	5×10^{10}	10^{14}		Ω
Isolation voltage	BV_S	AC 1 min		2500			Vrms
		AC 1 s, in oil			5000		
		DC 1 min, in oil			5000		V_{dc}

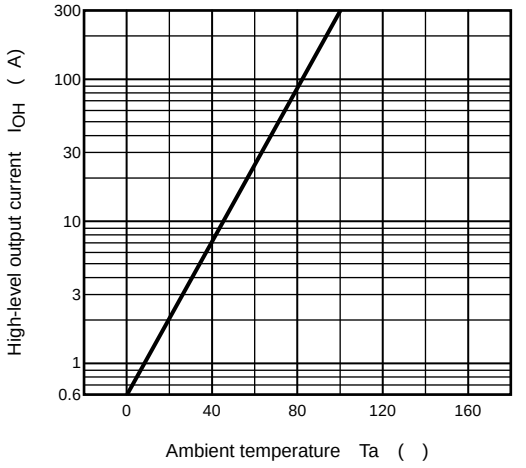
$I_F - V_F$



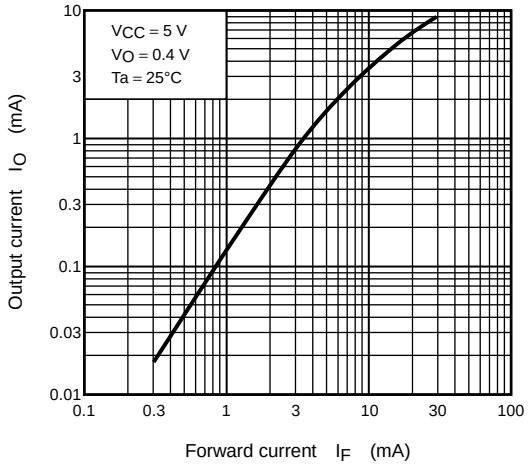
$\Delta V_F/\Delta Ta - I_F$



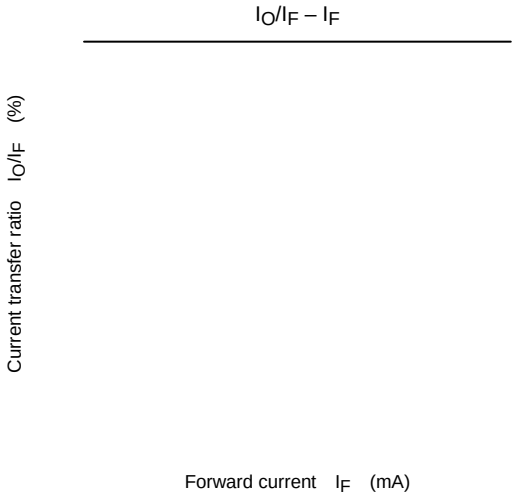
I_{OH} (1) – Ta



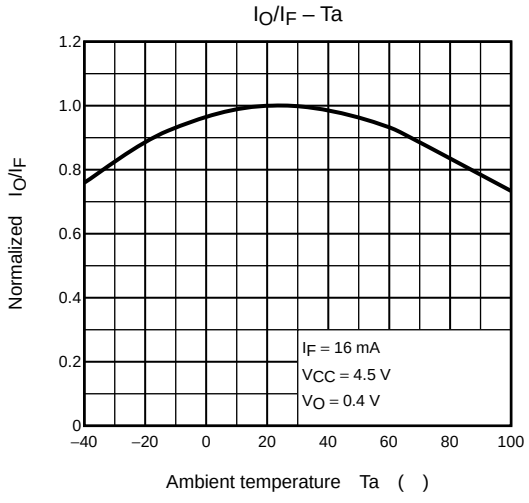
$I_O - I_F$



$I_O/I_F - I_F$

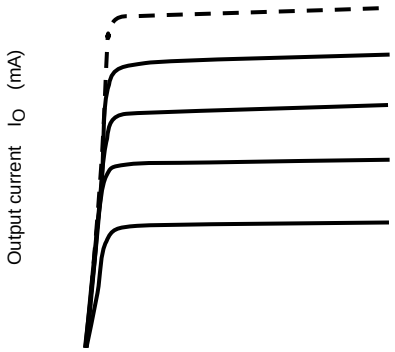


$I_O/I_F - Ta$



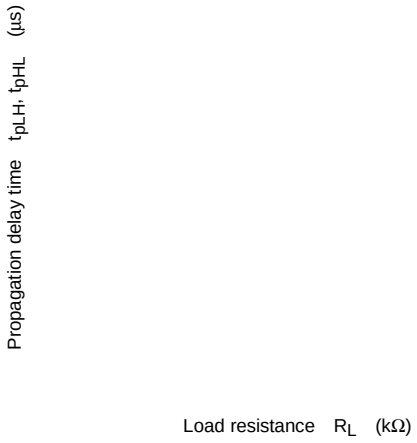
: The above graphs show typical characteristics.

$I_O - V_O$



$V_O - I_F$

t_{pHL}, $t_{pLH} - R_L$



: The above graphs show typical characteristics.

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