TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

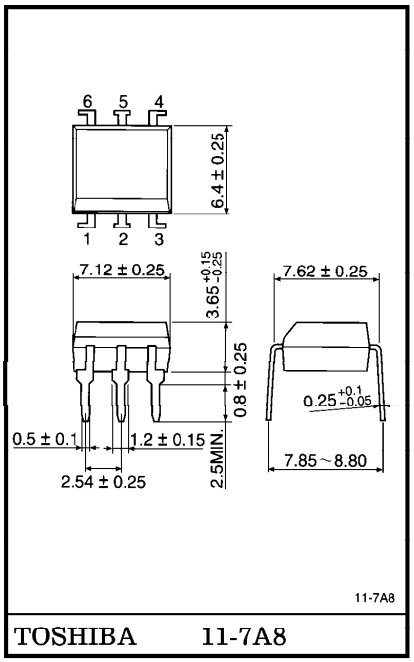
4N25(Short), 4N25A(Short), 4N26(Short), 4N27(Short), 4N28(Short)

AC LINE / DIGITAL LOGIC ISOLATOR.
DIGITAL LOGIC / DIGITAL LOGIC ISOLATOR.
TELEPHONE LINE RECEIVER.
TWISTED PAIR LINE RECEIVER.
HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL.
RELAY CONTACT MONITOR.

The TOSHIBA 4N25 (Short) through 4N28 (Short) consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in-line package.

- Switching Speeds : 3μs (Typ.)
- DC Current Transfer Ratio : 100% (Typ.)
- Isolation Resistance : $10^{11}\Omega$ (Min.)
- Isolation Voltage : 2500Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

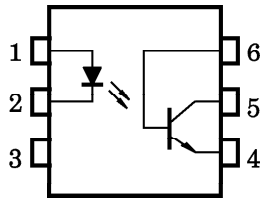
Unit in mm



TOSHIBA 11-7A8

Weight : 0.4g

PIN CONFIGURATIONS (Top view)



1 : ANODE
2 : CATHODE
3 : N.C.
4 : EMITTER
5 : COLLECTOR
6 : BASE

961001EBC2

MAXIMUM RATINGS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current (Continuous)	I_F	80	mA
	Forward Current Derating	ΔI_F / °C	1.07 (*)	mA / °C
	Peak Forward Current (Note 1)	I_{PF}	3	A
	Power Dissipation	P_D	150	mW
	Power Dissipation Derating	ΔP_D / °C	2.0 (*)	mW / °C
	Reverse Voltage	V_R	3	V
DETECTOR	Collector-Emitter Voltage	BV_{CEO}	30	V
	Collector-Base Voltage	BV_{CBO}	70	V
	Emitter-Collector Voltage	BV_{ECO}	7	V
	Collector Current (Continuous)	I_C	100	mA
	Power Dissipation	P_C	150	mW
	Power Dissipation Derating	ΔP_C / °C	2.0 (*)	mW / °C
COUPLED	Storage Temperature Range	T_{stg}	−55~150	°C
	Operating Temperature Range	T_{opr}	−55~100	°C
	Lead Soldering Temperature (10s)	T_{sol}	260	°C
	Total Package Power Dissipation	P_T	250	mW
	Total Package Power Dissipation Derating	ΔP_T / °C	3.3 (*)	mW / °C

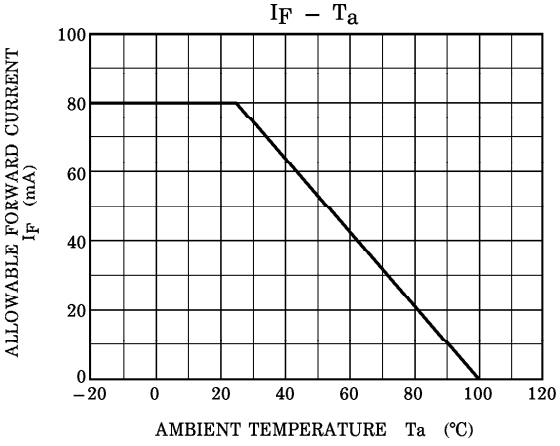
(Note 1) Pulse width 300μs, 2% duty cycle.
(*) Above 25°C ambient.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

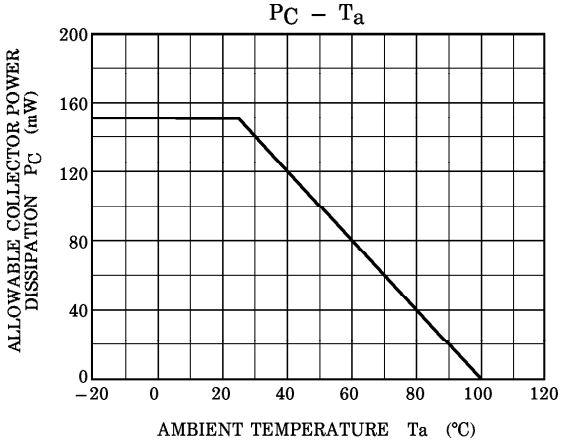
	CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage		V_F	I_F=10mA	—	1.15	1.5	V
	Reverse Current		I_R	V_R=3V	—	—	100	μA
	Capacitance		C_D	V=0, f=1MHz	—	30	—	pF
DETECTOR	DC Forward Current Gain		h_{FE}	V_{CE}=5V, I_C=500μA	—	200	—	—
	Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C=1mA, I_F=0	30	—	—	V
	Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	I_C=100μA	70	—	—	V
	Emitter-Collector Breakdown Voltage		$V_{(BR)ECO}$	I_E=100μA	7	—	—	V
	Collector Dark Current		I_{CEO}	V_{CE}=10V	—	1	50	nA
	Collector Dark Current		I_{CBO}	V_{CB}=10V	—	0.1	20	nA
	Collector-Emitter Capacitance		C_{CE}	V=0, f=1MHz	—	10	—	pF
COUPLED	Current Transfer Ratio		I_C / I_F	I_F=10mA, V_{CE}=10V	20	100	—	%
	Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_F=50mA, I_C=2mA	—	0.1	0.5	V
	Capacitance Input to Output		C_S	V_S=0, f=1MHz	—	0.8	—	pF
	Isolation Resistance		R_S	V_S=500V, R.H.≦60%	10^{11}	—	—	Ω
	Isolation Voltage		BV_S	AC, 1 minute	2500	—	—	Vrms
		4N25, 4N25A	BV_S (*)	AC, Peak	2500	—	—	Vpk
		4N26, 4N27			1500	—	—	
		4N28			500	—	—	
		4N25A		AC, 1 second	1775	—	—	Vrms
	Rise / Fall Time		t_r / t_f	V_{CE}=10V, I_C=2mA R_L=100Ω	—	2	—	μs
	Rise / Fall Time		t_r / t_f	V_{CB}=10V, I_{CB}=50μA R_L=100Ω	—	200	—	ns

(*) JEDEC registered minimum BV_S, however, TOSHIBA specifies a minimum BV_S of 2500Vrms, 1 minute.

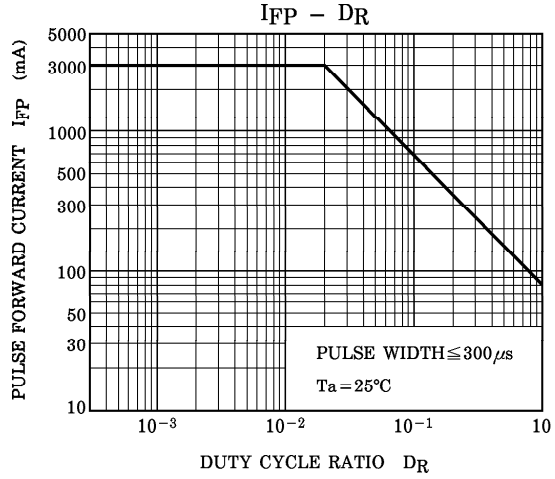
$I_F - T_a$



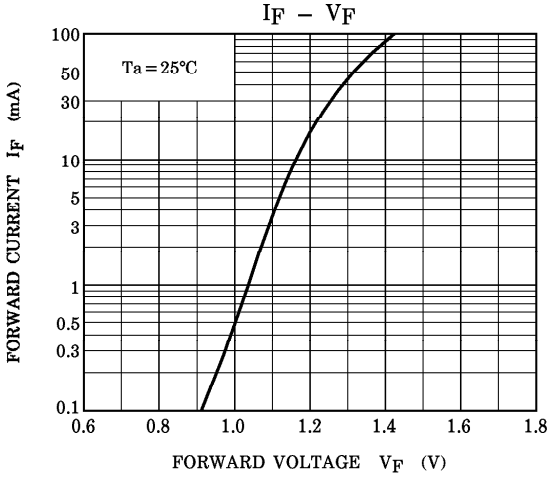
$P_C - T_a$



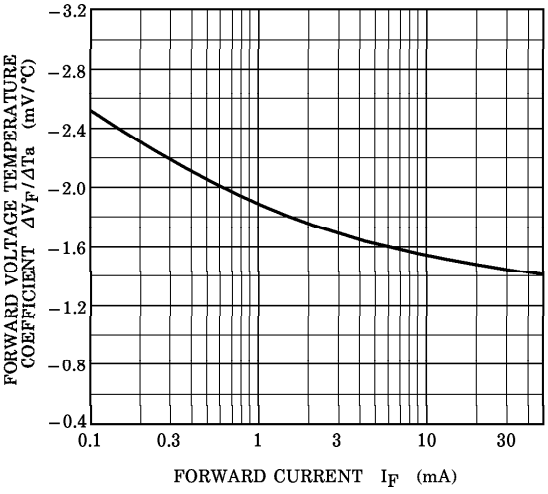
$I_{FP} - D_R$



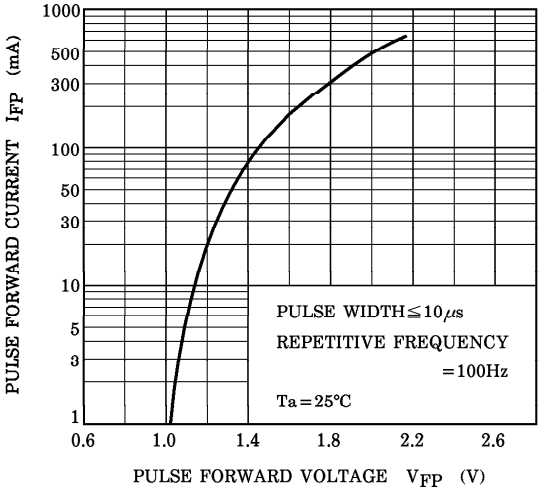
$I_F - V_F$



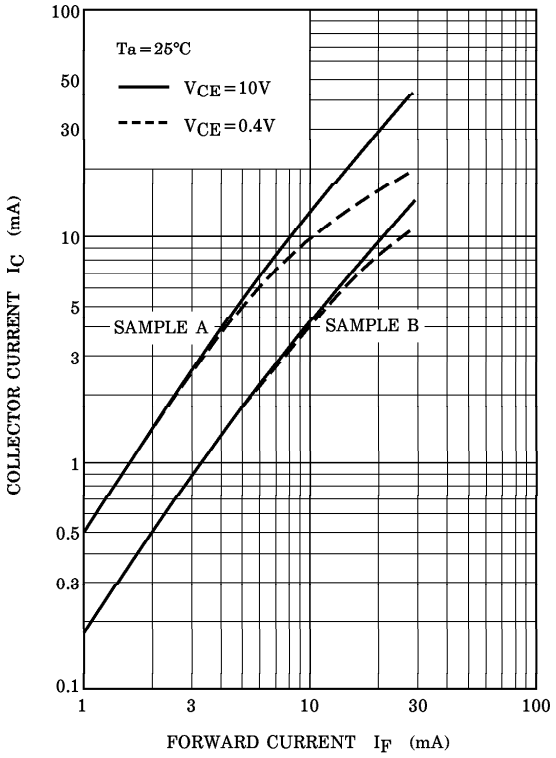
$\Delta V_F / \Delta Ta - I_F$



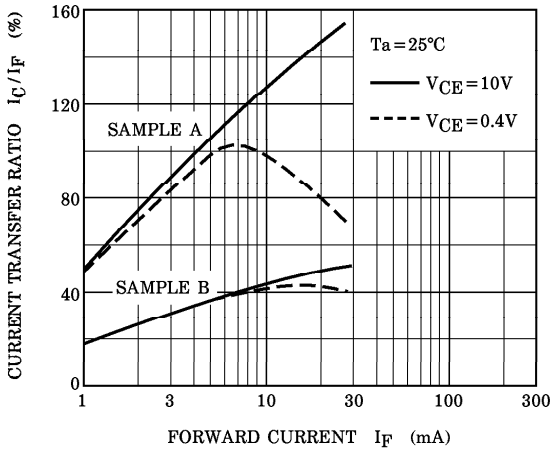
$I_{FP} - V_{FP}$



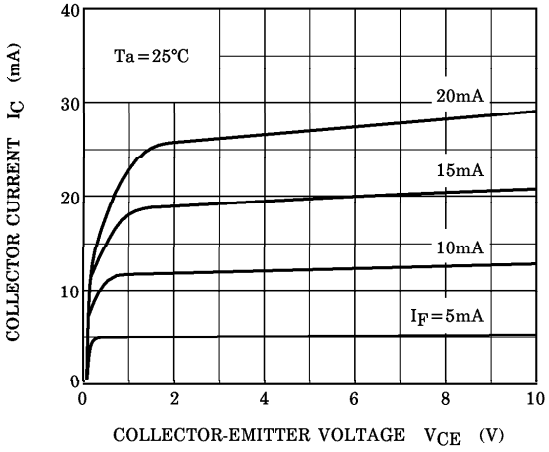
$I_C - I_F$



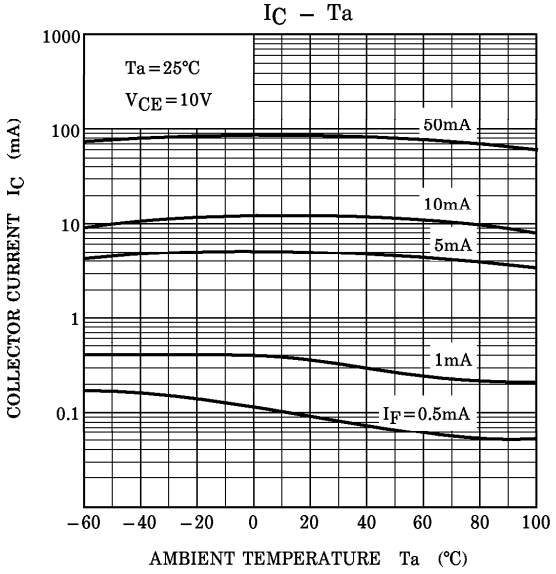
$I_C / I_F - I_F$



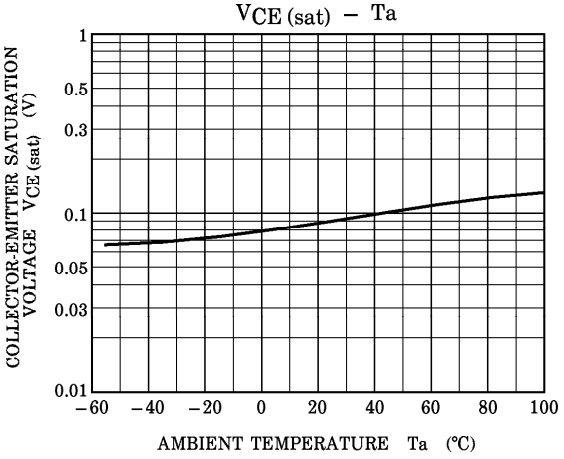
$I_C - V_{CE}$



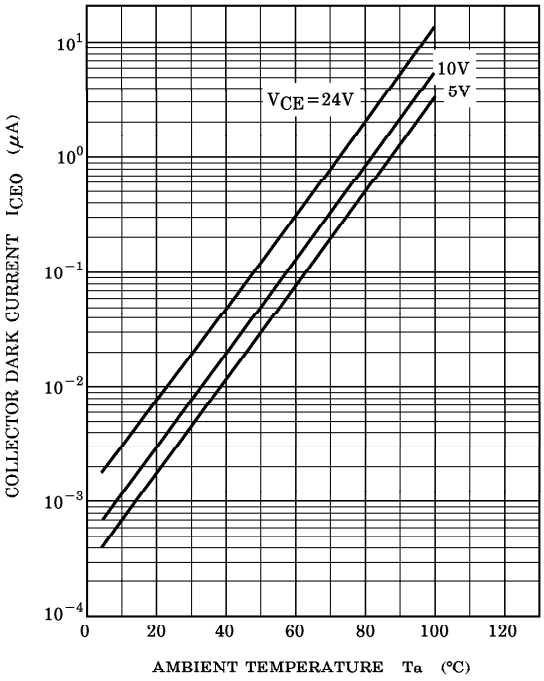
$I_C - Ta$



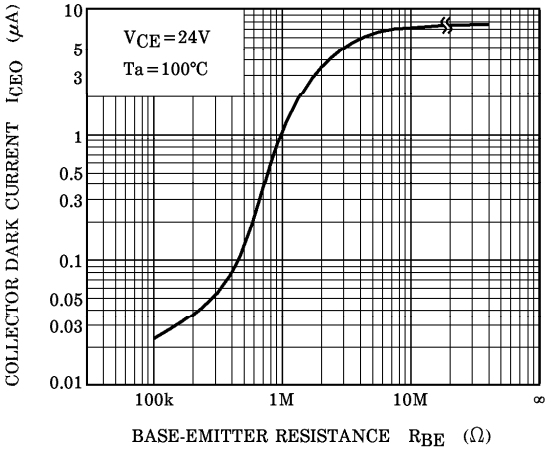
$V_{CE\,(sat)} - Ta$



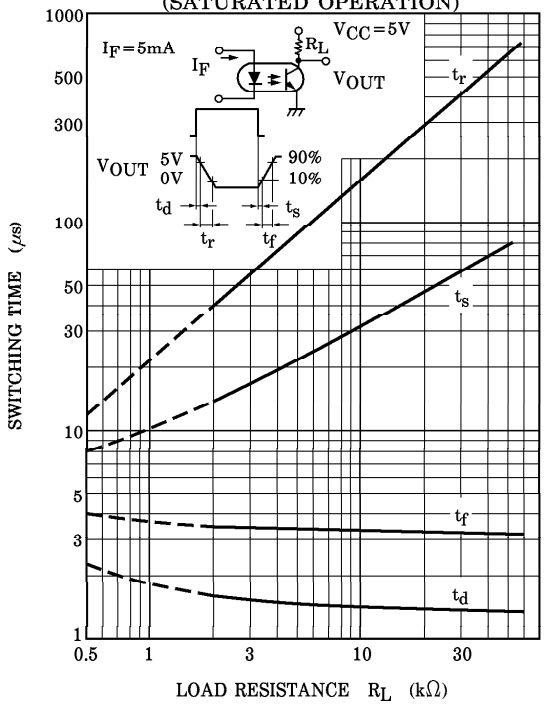
I_{CEO} – Ta



I_{CEO} – R_{BE}



SWITCHING CHARACTERISTICS – R_L
(SATURATED OPERATION)



SWITCHING CHARACTERISTICS – R_{BE}
(SATURATED OPERATION)