

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

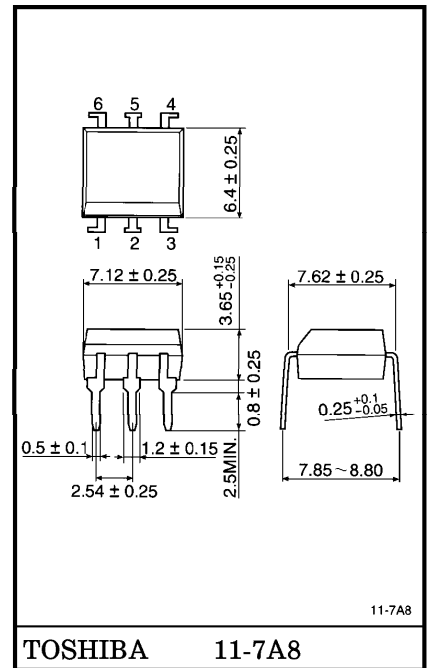
**4N29(Short), 4N29A(Short), 4N30(Short), 4N31(Short)
4N32(Short), 4N32A(Short), 4N33(Short)**

- AC LINE / DIGITAL LOGIC ISOLATOR.
- DIGITAL LOGIC/DIGITAL LOGIC ISOLATOR.
- TELEPHONE LINE RECEIVER.
- TWISTED PAIR LINE RECEIVER.
- RELAY CONTACT MONITOR.

The TOSHIBA 4N29 (Short) through 4N33 (Short) consists arsenide infrared emitting diode coupled with a silicon photo darlington in a dual in-line package.

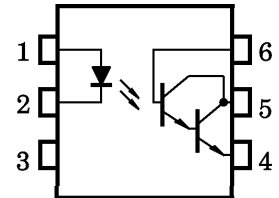
- Switching Time : 100 μ s (Max.)
- DC Current Transfer Ratio : 500%
- Isolation Resistance : 10¹¹ Ω (Typ.)
- Isolation Voltage : 2500V_{rms} (Min.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.4g

PIN CONFIGURATIONS (Top view)



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

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}	30	V
	Emitter-Collector Voltage	BV _{ECO}	5	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	T _{sol}	260	°C
	Total Package Power Dissipation	P _T	250	mW
	Total Package Power Dissipation Derating	ΔP _T / °C	3.3(*)	mW / °C

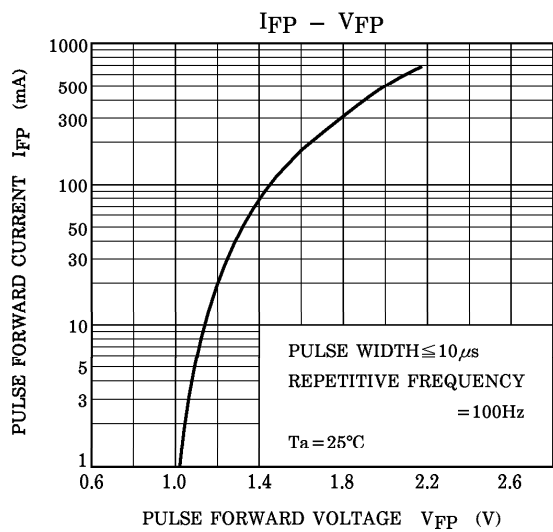
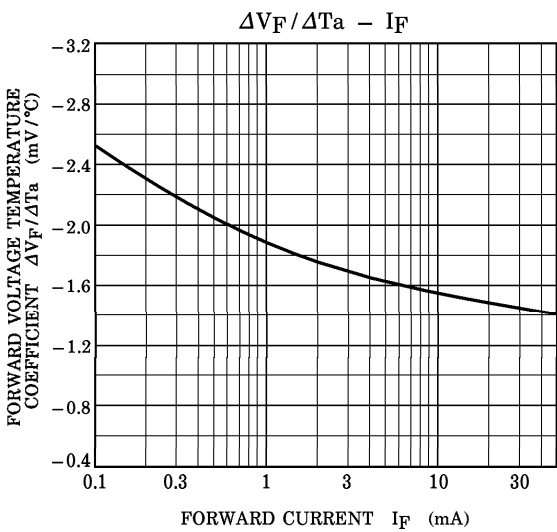
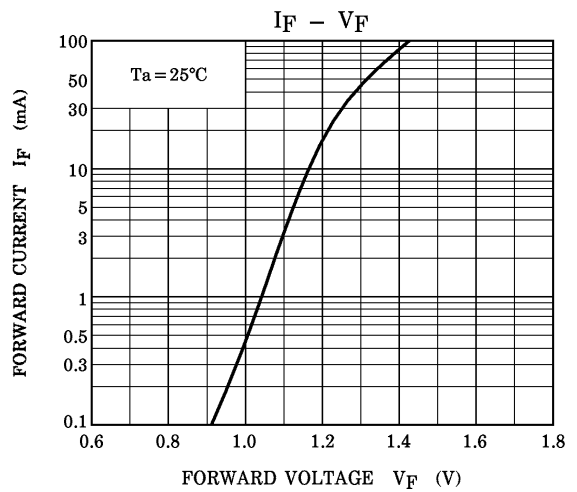
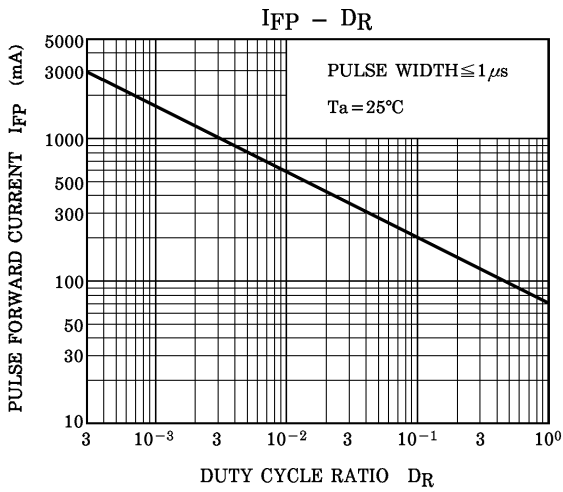
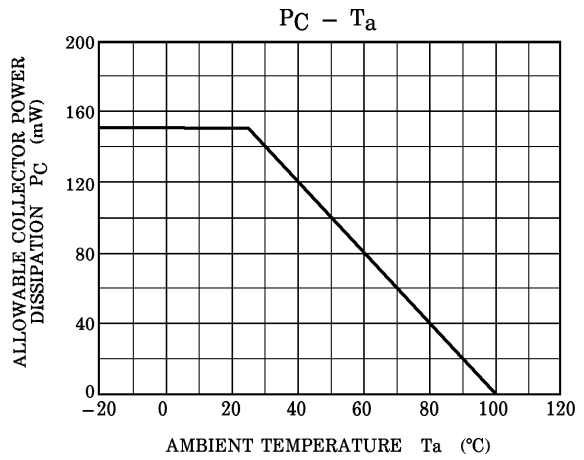
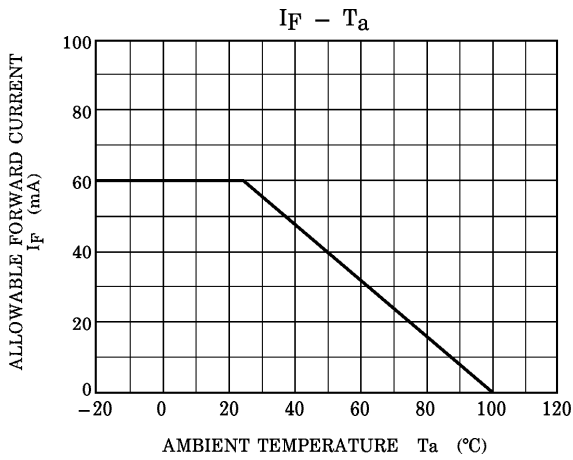
(Note 1) Pulse width 300 μs, 2% duty cycle.

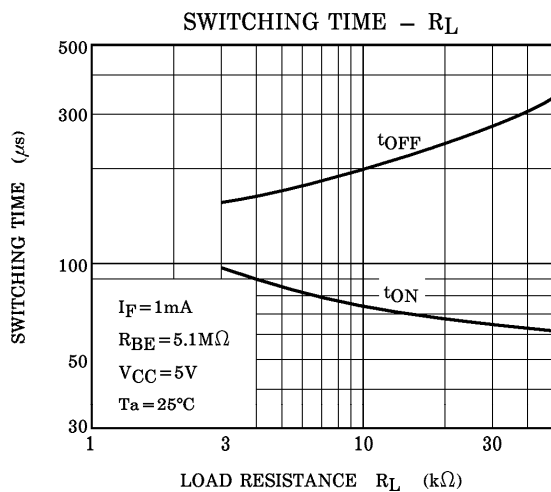
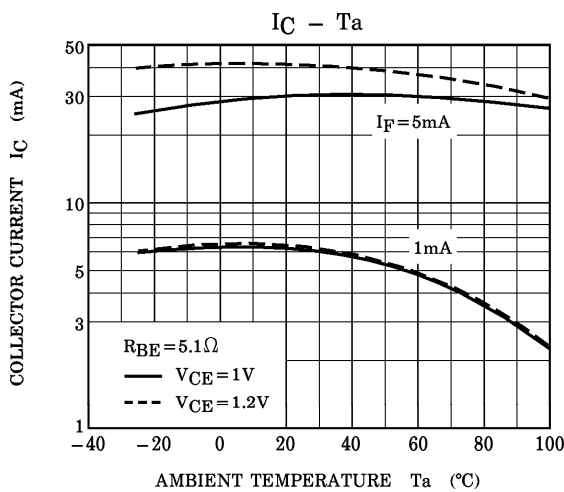
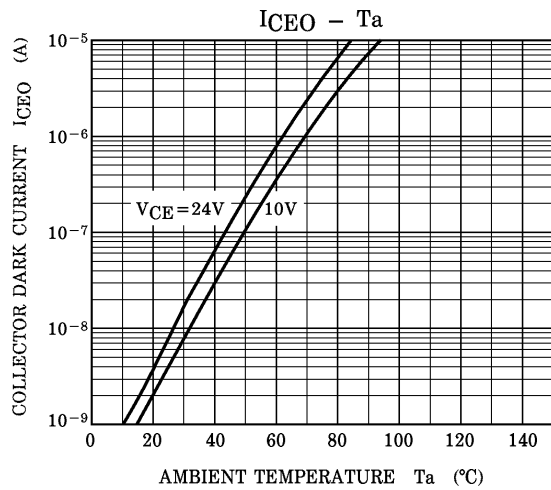
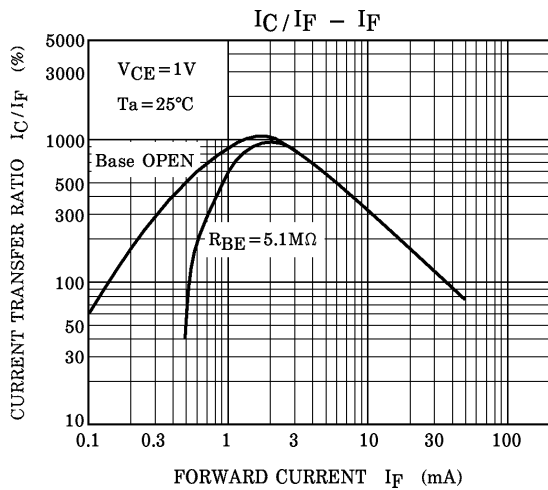
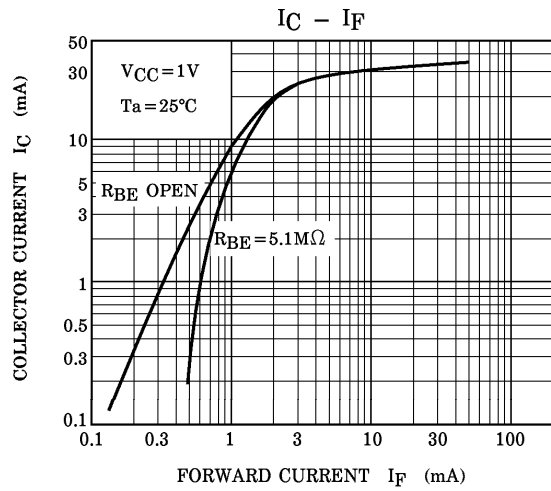
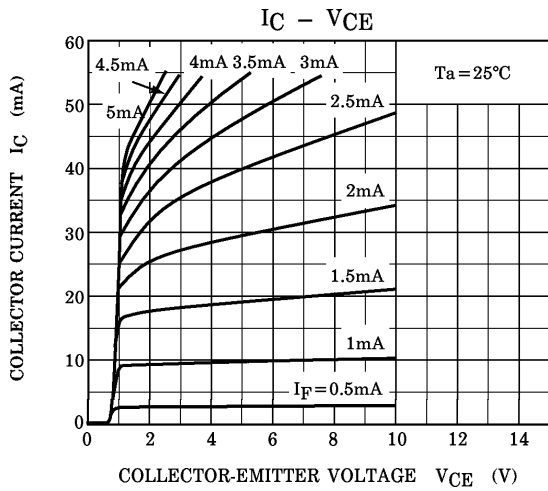
(*) Above 25°C ambient.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	—	1.15	1.5	V	
	Reverse Current	I_R	$V_R = 3\text{V}$	—	—	100	μA	
	Capacitance	C_D	$V = 0, f = 1\text{MHz}$	—	30	—	pF	
DETECTOR	DC Forward Current Gain	h_{FE}	$V_{CE} = 5, I_C = 0.5\text{mA}$	—	10k	—	—	
	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	30	—	—	V	
	Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$	30	—	—	V	
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$	5	—	—	V	
Collector Dark Current		I_{CEO}	$V_{CE} = 10\text{V}$	—	1.0	100	nA	
COUPLED	Collector Output Current	4N32, 4N32A 4N33	$I_F = 10\text{mA}, V_{CE} = 10\text{V}$	50	—	—	mA	
		4N29, 4N29A 4N30		10	—	—		
		4N31		5	—	—		
	Collector-Emitter Saturation Voltage	4N29, 4N29A 4N30, 4N32 4N32A, 4N33	$V_{CE(sat)}$	$I_F = 8\text{mA}, I_C = 2\text{mA}$	—	—	1.0	V
		4N31			—	—	1.2	
	Turn-on Time		t_{ON}	$I_F = 200\text{mA}, V_{CC} = 10\text{V}$ $I_C = 50\text{mA}$	—	—	5	μs
	Turn-off Time	4N29, 4N29A 4N30, 4N31	t_{OFF}		—	—	40	μs
		4N32, 4N32A 4N33			—	—	100	
	Capacitance Input to Output		C_S	$V = 0, f = 1\text{MHz}$	—	0.8	—	pF
	Isolation Resistance		R_S	$V = 500\text{V}$	—	10^{11}	—	Ω
Isolation Voltage			BV_S	$\text{AC}, 1 \text{ minute R. H.} \leq 60\%$		2500	V_{rms}	
	4N29, 4N29A 4N32, 4N32A	$BV_S (*)$	AC, peak	2500	—	—	V_{pk}	
				1500	—	—		
	4N30, 4N31 4N33							
4N29A, 4N32A			AC, 1 second	1775	—	—	V_{rms}	

(*) JEDEC registered minimum BV_S , however, Toshiba specifies a minimum BV_S of $2500V_{rms}$ 1 minute.





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